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SIXTH ANNUAL REPORT

OF THE

Indiana Livestock Breeders' Association

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SEP 20 1927

UNIVERSITY OF ILLINOIS

ANNUAL MEETING

AT

STATE HOUSE, INDIANAPOLIS, IND.

January 6, 1910

C. N. ARNETT, Secretary

BURT-HAYWOOD CO.
LAFAYETTE, IND.
1910

MURPHEY-BIVINS CO. LAFAYETTE, IND



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The printing and distribution of the Annual Report of the Indiana Livestock Breeders' Association is made possible by an Act of the Legislature of 1907. The proceedings of meetings of the Association previous to 1908 can be found in the Annual Report of the Indiana State Board of Agriculture.

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Agric.

OFFICERS AND EXECUTIVE COMMITTEE, INDIANA LIVE-STOCK BREEDERS' ASSOCIATION

1910

*President, Warren T. McCray,	- - - - -	Kentland
*Vice-President, T. A. Coleman,	- - - - -	Rushville
*Secretary, C. N. Arnett,	- - - - -	Lafayette
*Treasurer, Maurice Douglas,	- - - - -	Flat Rock
*Ex-Committeeman, Edward Smith,	- - - - -	Indianapolis

Members of Advisory Committee of Experiment Station

T. A. Coleman,	- - - - -	Rushville
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BOARD OF DIRECTORS

State Board of Agriculture

Clem Graves, Bunker Hill, '12

*Oscar Hadley, Plainfield, '11

Swine Breeders' Association

Thos. Vinnedge, Hope, '13 John Harcourt, New Augusta, '12

*T. A. Coleman, Rushville, '11

Angus Breeders' Association.**

D. C. Pfendler, Acton, '10 W. R. Pleak***

*W. J. Beckett, Indianapolis, '11

Hereford Breeders' Association

A. J. McDonald, Bedford, '13 W. T. McCray, Kentland, '12

*Frank VanNatta, Fowler, '11

Shorthorn Breeders' Association

James E. Elder, Marshall, '13 Maurice Douglas, Flat Rock, '12

*W. B. Peden, Spencer, '11

Wool Growers' Association.

E. R. Smith, Indianapolis, '13 Geo. Parnell, Wingate, '12

*J. L. Thompson, Gas City, '11

*Time expires January, 1911.

**New directors not chosen for Angus Association.

***Resigned.

20.5.27 dirg V.G., 1910 cont. B.C.

LIST OF COMMITTEES APPOINTED

January, 1910

Legislative Committee

T. A. Coleman, Rushville.
Warren T. McCray, Kentland.
W. J. Beckett, Indianapolis.

Program Committee

C. N. Arnett, Lafayette.
Clem Graves, Bunker Hill.
Edw. R. Smith, Indianapolis.
Jas. E. Elder, Marshall.
John Harcourt, New Augusta.

Resolutions Committee

A. J. McDonald, Bedford.
Frank VanNatta, Fowler.
James E. Elder, Marshall.

Membership Committee

J. H. Skinner, Lafayette.
C. A. Kurtze, Indianapolis.
Thos. Vinnedge, Hope.

OFFICERS AND DIRECTORS, INDIANA LIVESTOCK BREEDERS' ASSOCIATION

Presidents

W. S. Robbins	-	-	-	-	-	-	1904-1908
J. L. Thompson	-	-	-	-	-	-	1908-1909
W. J. Beckett	-	-	-	-	-	-	1909-1910

Vice-Presidents

Joe Cunningham	-	-	-	-	-	-	1904-1906
Charles Wellington	-	-	-	-	-	-	1906-1908
T. A. Coleman	-	-	-	-	-	-	1908-1909
Warren T. McCray	-	-	-	-	-	-	1909-1910

Secretaries

J. H. Skinner	-	-	-	-	-	-	1904-1910
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Treasurers

J. L. Thompson	-	-	-	-	-	-	1904-1908
W. J. Beckett	-	-	-	-	-	-	1908-1909
T. A. Coleman	-	-	-	-	-	-	1909-1910

Ex-Committeemen

W. J. Beckett	-	-	-	-	-	-	1904-1908
Frank VanNatta	-	-	-	-	-	-	1908-1909
W. B. Peden	-	-	-	-	-	-	1909-1910

BOARD OF DIRECTORS

State Board of Agriculture

Oscar Hadley (Time expires January, 1911)	-	-	-	-	-	-	1904-
Joe Cunningham	-	-	-	-	-	-	1904-1906
David Wallace	-	-	-	-	-	-	1904-1910
I. N. Brown	-	-	-	-	-	-	1906-1909
Clem Graves	-	-	-	-	-	-	1909-

Swine Breeders' Association

O. W. Canady	-	-	-	-	-	-	1904-1908
F. F. Moore	-	-	-	-	-	-	1904-1906
A. C. Hodson	-	-	-	-	-	-	1904-1907
Chas. Wellington	-	-	-	-	-	-	1906-1909
**W. J. Quick	-	-	-	-	-	-	1907-1909
T. A. Coleman	-	-	-	-	-	-	1908-
John Harecourt	-	-	-	-	-	-	1909-
Thomas Vinnedge (Time expires 1913)	-	-	-	-	-	-	1909-

Angus Breeders' Association*

W. J. Beckett (Time expires January, 1911)	-	-	-	-	-	-	-	1904-
George Henderson	-	-	-	-	-	-	-	1904-1906
William Avery	-	-	-	-	-	-	-	1904-1907
Lew Kerr	-	-	-	-	-	-	-	1906-1909
D. C. Pfendler	-	-	-	-	-	-	-	1907-
**W. R. Pleak	-	-	-	-	-	-	-	1909-1910

Hereford Breeders' Association

Clem Graves	-	-	-	-	-	-	-	1904-1908
W. C. Hauelsen	-	-	-	-	-	-	-	1904-1906
C. E. Amsden	-	-	-	-	-	-	-	1904-1907
Ed. L. Wilson	-	-	-	-	-	-	-	1906-1909
C. E. Kurtze	-	-	-	-	-	-	-	1907-1910
Frank VanNatta	-	-	-	-	-	-	-	1908-
Warren T. McCray	-	-	-	-	-	-	-	1909-
A. J. McDonald	-	-	-	-	-	-	-	1910-

Shorthorn Breeders' Association

W. S. Robbins	-	-	-	-	-	-	-	1904-1908
J. W. Donnelly	-	-	-	-	-	-	-	1904-1906
T. J. Christian	-	-	-	-	-	-	-	1904-1907
Frank Cotton	-	-	-	-	-	-	-	1906-1909
J. W. Brendel	-	-	-	-	-	-	-	1907-1910
W. B. Peden	-	-	-	-	-	-	-	1908-
Maurice Douglas	-	-	-	-	-	-	-	1909-
J. E. Elder	-	-	-	-	-	-	-	1910-

Wool Growers' Association

J. L. Thompson (Time expires 1911)	-	-	-	-	-	-	-	1904-
H. L. Frost	-	-	-	-	-	-	-	1907-1909
H. H. Keim	-	-	-	-	-	-	-	1907-1910
Geo. Parnell	-	-	-	-	-	-	-	1909-
Ed. R. Smith	-	-	-	-	-	-	-	1910-

*New Directors not chosen by Angus Association 1910.

**Resigned.

SIXTH ANNUAL MEETING INDIANA LIVESTOCK BREEDERS' ASSOCIATION

Indianapolis, Indiana

Meeting of Board of Directors

9:00 A. M., Thursday, January 6, 1910

The Board of Directors of the Indiana Livestock Breeders' Association met in Room 11 of the State House, Indianapolis, Indiana. In the absence of the president, the meeting was called to order by the vice-president, Warren T. McCray. The following directors were present: Messrs. Warren T. McCray, Frank VanNatta, T. A. Coleman, Maurice Douglas, Clem Graves, J. H. Skinner, A. J. McDonald, E. R. Smith and W. F. Parnell represented by Charles A. Kurtze.

Mr. McCray: The first thing will be the reading of the minutes of last meeting.

Prof. Skinner: Concerning the minutes, I may say that I wish to refer you to the fifth annual report of the Association and will give a brief summary of the minutes as they are presented in this report. The most important action taken by the Board of Directors last year relates to the approval of requests from the Indiana Swine Breeders', Indiana Cattle Feeders', and the Indiana Wool Growers' Associations to become auxiliaries of this Association. This request was considered and approved by the directors, later by the general Association.

The conditions under which these associations were made auxiliaries of this Association are given in the last annual report. It should be understood that this Association has a state appropriation of \$500 and that the money is used for holding meetings, advertising, printing, etc., but it cannot be used for salaries or anything of that kind. By making the associations above named auxiliaries of the Indiana Association, it enables us to use some of the state fund in advancing the work of these associations. This is a desirable thing as the Swine Breeders' Association has members from the various breed associations while the Cattle Feeders' Association is open to all farmers and cattle feeders and the Wool Growers' Association takes in all sheep breeders. The requests were approved with the understanding that the Indiana Livestock Breeders' Association would furnish a stenographer in

order to obtain a stenographic report of the meetings of these auxiliary associations and that such reports should be embodied in the annual report of this association and also with the understanding that they should receive some financial assistance in obtaining good speakers for their meetings. This year such reports and speakers have been provided for.

Another matter of interest was an amendment to the constitution which reduced the membership fee from \$1.00 to 50 cents annually.

Full information on these matters will be found printed in the last annual report.

(Moved and carried that the report be accepted.)

Mr. McCray: The next order of business will be the Treasurer's report.

TREASURER'S REPORT

—by—

T. A. Coleman, Treasurer

Receipts for year from Jan. 7, '09—Jan. 5, '10.

To membership fees	\$ 17.00
To state fund, April, 1909	182.33
To state fund, September, 1909	109.20

Total receipts	\$308.53	\$308.53
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Expenditures from Jan. 7, '09 to Sept. 30, '09.

By deficit Jan. 7, 1909	\$ 46.00
Traveling expenses Secretary on account of annual meeting, Jan. 5-8, 1909	18.25
Service and traveling expenses Willis O. Wing on account of annual meeting	54.00
Services and expenses H. W. Mumford on ac- count of annual meeting	35.60
Feb. 8—Mary O. Brown, stenographic report	9.50
Feb. 9—F. E. Dillan, stenographic report ...	31.73
Sept. 18, letter heads, Burt-Haywood Co.	2.50
Printing 5th Annual Report, 500 copies, Burt- Haywood Co.	81.70
Sept. 20, postage, T. W. Burt, postmaster ...	10.00
Sept. 20, clerical help	15.00
May 8, telephone toll80

April, '09, traveling expenses Sec'y, Indianapolis and return	3.00
Stamps45

Expenditures to Sept. 30, 1909\$308.53

Expenditures Oct. 1, '09 to Jan. 5, '10. (Bills outstanding Jan. 5, '10, paid by advances from J. H. Skinner, Secretary.)	
Services and traveling expenses, C. F. Curtiss on account of Cattle Feeders' Convention\$	50.00
Clerical help	15.00
Printing programs	3.50

Total outstanding bills Jan. 5, '10.....\$	68.50	
Total expended Jan. 7, '09 to Jan. 5, '10.....	377.03	
Total receipts Jan, '09 to Jan. 10.....		\$308.53
Outstanding bills Jan. 5, '10.....		68.50

	\$377.03	\$377.03
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Prof. Skinner: It should be mentioned in connection with the Treasurer's report that all bills that are paid from state funds must be receipted and that these receipts are on file in the Auditor's office. Duplicate receipts are in my files and I would suggest that you have a committee to audit the report. The only reason for filing receipts in my office is that most of the bills have been paid through my office and practically all correspondence concerning such matters is on file there.

(Moved and carried that the report be accepted.)

Mr. T. A. Coleman: While we are on this subject, and while I am quite well aware of the fact that it would in no sense recompense him for the labor he has put upon this work, I would like to make a motion that all funds that are received from membership fees be turned over to the Secretary in part pay for services rendered.

(Seconded).

Prof. Skinner: If I may have a word, I might say that as far as I am personally concerned, I would rather see the motion fail. If it is the sense of this body that the membership fees be turned over as salary, in the future, it is agreeable to me, although you will find that occasionally there are little bills that you do not care to pay from the State Fund. This last year I had

a bill for stationery that was overlooked, and I did not like to let the bill stand. Last year we also paid the traveling expenses of Mr. Pleak as a member of the Legislative Committee and that does not appear in the present bill to the State Auditor.

Mr. Coleman: In view of the fact that at the meeting last year the statement was made by Prof. Skinner that he earnestly desired to be relieved of the work of Secretary after this year, and in view of the fact that the success of this organization has been in large part due to his efficient services, and as Mr. Pleak's expenses have been paid and there is no Legislature this year, I move that the fees received for membership in the Indiana Livestock Breeders' Association be given to Mr. Skinner.

(Carried.)

Prof. Skinner: If the Directors insist on this I must decline the money.

Mr. Coleman: Then I would move that a committee of three be appointed to spend this money for some sort of suitable testimonial that Mr. Skinner will accept, as a mark of our appreciation of services rendered.

(Motion seconded and carried.)

Mr. McCray: I think the suggestion is well-timed, and I will appoint on that committee:

T. A. Coleman,
Maurice Douglas,
Clem Graves.

Prof. Skinner: I certainly appreciate this. I have not been in the business for the money that was in it, but because I thought I could do some good. I get a living salary at the University, and I have been glad to give some time and effort to the Association. I appreciate the attitude of the Directors, and assure you that it comes as a pleasant surprise which I shall treasure.

Mr. McCray: We will now have the report of the Legislative Committee by Mr. Coleman.

Report of Legislative Committee.

Mr. Coleman: I may say, gentlemen, that while I was a member of the Legislative Committee, I could not devote very much time to the work. I was here a few times during the session of Legislature, and we had great hopes of getting a considerable appropriation for equipment for the Experiment Station, and while we got some, I cannot say off-hand just how much. I think Prof. Skinner could make a better report than I can.

Prof. Skinner: Mr. Pleak was Chairman of this Committee

but he has moved out of the state, and consequently Mr. Coleman is not in position to make a report.

I feel that the work of the Legislative Committee, from this Association in connection with the committees from other associations, was very effective. Of course, the object of all this is that we may advance agriculture in the state, and I think the work that was done by the joint committee from the various State Agricultural Associations was very effective. They went to the Legislature last year and undertook to secure an appropriation for the State Board and for the University, especially for agriculture, and while the Governor vetoed the State Board appropriation before it got into the Legislature, he did not veto the University appropriations and they succeeded in increasing the appropriation for the station \$50,000, that is, giving it three times as much money as it had previously. We also got an appropriation of \$30,000 for a judging pavilion, which is in process of construction at the University, and an appropriation for a farm machinery building, amounting to \$20,000. In other words, we got \$50,000 for buildings for the School of Agriculture and \$50,000 for station work, and in addition to that they were able to help the University by securing \$150,000 for engineering. It was hard work to get this, but finally the committee compromised on two buildings for agriculture and the bill passed. It felt that the men who had been working for the agricultural appropriation had been working very hard, that this compromise was no more than right. Another year they should be able to do as much or better.

The whole situation, as far as getting appropriations for work in agricultural lines is concerned, is in good shape, both at the college and throughout the state. It was found last year when the committee took the matter up that the farmers were right back of the proposition and were willing to work for appropriations, and I think the work of the Legislative Committee has been exceptionally good.

I would also like to say that I believe it would be appreciated if this Board were to pass resolutions thanking Mr. Pleak for his effective services.

(Referred to Resolutions Committee).

Mr. McCray: Is there any discussion? If not, I will call for report of the Banquet Committee.

Report of Banquet Committee.

Mr. Coleman: In the absence of Mr. Wallace, Chairman of

the Committee, I may say that the Swine Breeders' Association expressed it as a sense of those present at their meeting that, as it has been such hard work to sell enough tickets to make the banquet a success this year, it may be well to leave the matter of banquet open for next year until the morning of the meeting, and then if enough are in favor of the banquet to easily guarantee its success, arrangements can be made to hold one and if not, it can be dispensed with.

I may also state that the Swine Breeders also expressed some desire to change the time of their meeting. They feel that they would like to come here Wednesday morning and have the entire day for the Indiana Swine Breeders' meeting and then have the individual breed meetings Wednesday night and the Indiana Livestock Breeders' meeting Thursday. In this way they could be here for the several meetings and it might be that a joint banquet could be arranged for Thursday night.

Following informal discussion, this matter was referred to the Executive Committee.

Mr. McCray: As the members of the Resolutions Committee are not here, I will appoint a new committee for this session only, as follows:

Dr. A. J. McDonald,
Frank W. VanNatta,
T. A. Coleman.

Report of Resolutions Committee.

(Resolutions presented by a Committee and passed at the regular session of the Association.)

Whereas, The efforts of the Indiana State Board of Agriculture in advancing the cause of agricultural education by elevating the ideals and standards of excellence of all farm products by conducting an exhibition that is second to none of like nature, and

Whereas, All funds appropriated by the State have been economically used and the results are fully appreciated by the people of the state, and

Whereas, Many improvements are badly needed on the State Fair Grounds, therefore

Be It Resolved, That the Indiana Livestock Breeders' Association respectfully urge the next General Assembly to make such provisions to meet these demands as may be possible.

Whereas, The services of Prof. J. H. Skinner in promoting the work of this Association are fully appreciated, and

Whereas, By his request he has been relieved of the work of the Secretaryship, therefore

Be It Resolved, That the thanks and good wishes of the members of the Indiana Livestock Breeders' Association be extended to him.

Whereas, The work of Hon. W. R. Pleak in advancing the cause of agricultural education by aiding in the securing of state funds to enlarge the work of the School of Agriculture at Purdue University and the Experiment Station was of a high order, and

Whereas, He has left the state for permanent residence, be it, therefore

Resolved, That the thanks of the members of the Indiana Livestock Breeders' Association be extended to him and that their best wishes go to him in his new home.

Be it further Resolved, That Hon. Will R. Pleak be made the first honorary member of the Indiana Livestock Breeders' Association:

Report of Membership Committee.

Mr. Skinner: I have not had much time to give to the matter of securing new members. However, I have sent out a number of letters to the members notifying them to be present and to obtain new members if possible. By the attendance you can see that very little has resulted from this correspondence. In order to obtain new members it will be necessary for us to give this matter greater effort and I have sometimes felt that we might get new life into the Association by making some sort of a special program which will arouse the interest of breeders and farmers throughout the state. I believe that members might be secured by affecting county organizations and it is important that our membership be largely increased.

Mr. McCray: We will now hear the report of the Program Committee.

Secretary: The Program Committee reports that speakers have been secured and a program arranged as follows:

INDIANAPOLIS, INDIANA.

Thursday, January 6, 1910.

Morning Session.

- 9:00 Meeting of Directors.
- 10:00 The Importance, Care and Management of the Farmers' Flock.....Prof. W. C. Coffey, University of Illinois.
 The Horse Industry in Indiana.....
Mr. C. N. Arnett, Purdue University.
 Alfalfa in Indiana
Prof. A. T. Wianeko, Purdue University.

Afternoon Session.

- 1:00 Livestock and the Homestead.....
Mrs. Virginia C. Meredith, Cambridge City, Ind.
- The Utilization of the Corn Crop.....
Hon. D. F. Maish, Frankfort, Ind.

Mr. McCray: Are there any other reports? If not, is there any new business to come up?

Secretary: I would like to report that the various breeders' associations have elected the following Directors:

Indiana State Board of Agriculture—No election.

Indiana Swine Breeders' Association—Thomas Vinnedge, Hope, re-elected for three years.

Angus Breeders, Association—No election; this, owing to the resignation of W. R. Pleak, leaves but one regularly elected Director, although D. C. Pfendler will continue in office until his successor is elected.

Hereford Breeders' Association—Dr. A. J. McDonald, Bedford, Ind., elected for three years.

Shorthorn Breeders' Association—James E. Elder, Marshall, Ind., elected for three years.

Election of Officers.

Secretary: As the number of Directors present is small, I would make a motion that we waive the constitution and elect by acclamation instead of by ballot.

(Carried.)

Mr. Coleman: As President of the Corn Growers' Association and as President of the Swine Breeders' Association, I made a recommendation to both these bodies, that it be the policy of these associations to change the president every year. The president's business is mostly to help the secretary in getting up the program, and by changing each year you can get a man with different acquaintances, and who can bring other men into the program. He will bring new ideas, and I think it good policy. The Corn Growers' Association needs a man with a little training, so they adopted the policy of elevating the Vice-President each year. I, therefore, move that Mr. Warren T. McCray, the Vice-President, be this year elected as President of the Indiana Livestock Breeders' Association.

(Seconded.)

Mr. McCray: I do not want to disturb the custom or go contrary to what is the desire of the Association, but I do really feel that Mr. Beckett should be continued in this office. He is a bright, active man, and makes a very good President.

(Motion carried.)

Mr. McCray: I thank you very much for this honor, and I will do all I can to further the interests of the Indiana breeders.

The election further resulted as follows:

Vice-President, T. A. Coleman, Rushville.

Secretary, C. N. Arnett, Lafayette.

Treasurer, Maurice Douglas, Flat Rock.

Ex. Committeeman, Edward R. Smith, Indianapolis.

Member of Advisory Com. Experiment Station, T. A. Coleman.

(Adjournment of meeting of Board of Directors.)

Thursday Morning, January 6, 1910.

Meeting called to order by the vice-president, Mr. Warren T. McCray, of Kentland.

Mr. McCray: The first number on the program this morning is "The Importance, Care and Management of the Farmer's Flock," by Prof. W. C. Coffey, of the University of Illinois.

THE IMPORTANCE, CARE AND MANAGEMENT OF THE FARMER'S FLOCK.

Prof. W. C. Coffey, University of Illinois.

Ladies and Gentlemen: Before leaving Urbana I was instructed by Prof. Ransom, Secretary of our Livestock Association, to convey to you the greetings of our Association. We are always glad to extend greetings to any organization in a sister state that is endeavoring to further the interests of the livestock industry.

Prof. Ransom also told me to tell you that this year we are giving a great deal of space on our program to the State Livestock Commission, which deals with diseases of farm animals and sanitary conditions generally as concerned livestock. This meeting will be held the 27th and 28th of this month, and we hope that some of you may find it convenient to meet with us. You perhaps know that the State Livestock Commission was created at the last session of our legislature, and has just commenced its work; but it is already making its influence felt, and we know this work will be of interest to you, because animal diseases is something that is of interest wherever livestock is kept.

How shall we measure the importance of the farmer's flock here in Indiana or in the whole corn belt? We can give several comparisons based on statistics which might be interpreted as showing up the importance of the sheep business in Indiana. For example, it may be stated that the estimated valuation of sheep and wool in this state January 1, 1909 was about \$6,728,000. The valuation upon horses and mules was 15 times as great; upon all cattle 3.6 times; upon swine 2.8 times. If you care to compare your production of mutton and wool with your leading farm crops you will find that your last year's corn crop was worth 12.3 times as much as your mutton and wool holdings; your wheat yield 6.6 times; your oats 2.5 times, and your hay 5 times as much.

You may wish to get an estimate of yourselves by comparing your sheep industry with that of the whole country or of other neighboring states. Your flocks represent 2.2% of the entire sheep population of the United States. You have 522,000 more than Illinois, and your valuation of sheep and wool is 1.2 times greater than that state. You are 1,895,000 head behind Ohio, and

the sheep products of that state are about two to two and a half times greater in value than yours. You are behind Michigan, slightly above Iowa, and about on a par with Missouri and Wisconsin.

By comparing present numbers with former years you show no material increase. You have more than you had sixteen years ago, but not many more. During the depressed times between 1893 and 1897 there was a pronounced decrease in numbers of sheep throughout the corn belt, and the revival of interest during the past few years has put us back to about where we were in '93. To be sure our valuation is greater than it was at that time, but other farm products have advanced correspondingly, so we have no accurate way of estimating how much better, if any, our sheep are than they were sixteen years ago.

If we attempt to get at the importance of the farmer's flock by comparing the number and value of the sheep kept in the north central section of the United States east of the Mississippi River, of which you are a part, with the far West, where sheep are handled principally on the ranges, we learn that the former region, characterized by farmer's flocks, has 8,292,000 valued at \$34,299,000, while the far western country has 34,274,000 valued at \$110,245,000.

The figures submitted tell adequately enough, perhaps, the size of Indiana's sheep business. From them we get some notion of how the corn belt compares with the far western range in this industry, but they do not indicate the importance of the farmer's flock to the farmer himself, and they do not at all indicate that the small flock is of such importance as to demand the serious consideration of the farmer now, and that it will command much more consideration in the future.

During the past few years, as stated above, there has been a tendency for the corn belt to get back into the sheep business. This tendency has not been in the nature of a rush, but a quiet, healthy growth. And if we are ever fully into the business there will probably be two general types of sheep handling. On the rough, hilly lands where the growing of grain in quantities is not feasible, the sheep will be the main interest of the farm, while on the fertile lands they will be kept in small numbers to help effect an economic consumption of all products of the farm. The latter proposition is of more widespread interest.

There are many **many** farms in this state that have no sheep, and it is surprising that the valuation of your sheep and wool compares as favorably as it does with that of each of the

other live stock interests, for nearly if not quite every farm maintains a number of horses, cattle and pigs. Moreover, farmers would be astounded if they were asked why they kept a few cattle, a few horses, or a few pigs. They would be justified in being greatly taken aback if such a question were asked. But the question, why do you keep sheep or why do you not keep them, causes no perturbation whatever. That is a natural question. Why should it be so? Sheep fit into the economy of any farm where live stock is kept. There are products on the farm which neither cattle nor pigs nor any other kind of live stock save sheep and goats will consume, and if the sheep is not there to take care of it it drops by the way as waste. This statement has been made hundreds of times. It is an old and true text from which much preaching has been done. It is a text which nearly every small, successful flock owner has taken up, and this widespread testimony should ultimately have influence even though it is taking a long time to bring about results. Again, the owner of the small flock testifies that the sheep is a cleaner, that he not only converts waste into the valuable products of mutton and wool, but that he does the same with weeds, those things we commonly regard as pests and enemies of good farming. I could enumerate instance after instance where owners of small flocks have realized large profits in their investment in sheep. When supplemented by good care at times when care is needed, the consumption of these materials, which are without value unless consumed by the sheep, makes the small flock yield a very large profit on the investment involved. Many times the profits do not appeal to us because the investment is small, but most of us, when once awakened, are too sensible to disregard small investments if the profit on them is large. I am sorry to say, however, that it is often difficult to effect the awakening. I often say to our Illinois audiences that judging from appearances as I ride through the country, we have more rabbits than sheep. At least, I see more of them, and I think my eyes are as well trained for seeing sheep as they are for rabbits. Were we to place 50 sheep on every 160 acres of farm land in Illinois we should have 10,000,000, and their valuation including wool would be over \$50,000,000. In this way we can realize what the possibilities for the importance of the farm flock are.

All the indications of the times encourage us to believe that there will be an awakening on the part of our corn belt farmers in favor of keeping a small flock of sheep. For several years past our people have been developing a liking for mutton, so

that in many of our cities the only checks to liberal consumption are high prices and the consequent lack of ability to buy. As mutton consumption increases there will be a growth in the number of consumers who are exacting in their demands. This exacting demand calls for lambs of choicest quality, which none but skillful native or corn belt producers have yet been able to grow.

The great ranges of the West where millions of sheep are grown, are constantly being encroached upon by settlers who are converting the land into general farms. This gives the West no opportunity to increase the numbers of her sheep, and it is doubtful if she will be able to maintain them even though they are constantly employing better methods of handling. This limiting of the range will naturally stimulate mutton production in the corn belt.

It seems to me that we are rapidly approaching the time in our farming when we shall feel the importance of making something out of every usable thing we grow. Land values are going to be too high to neglect the profit a small flock of sheep will bring through their converting weeds and neglected corners and fence rows into mutton and wool, even though the prices for these products rise no higher than they are now. The prices for grains—corn and wheat—have reached such a high level that we are forced to look for animals which do well on roughages with small amount of concentrates. For this kind of feeding sheep are well adapted.

Again, the importance of sheep appeals to us because they are dual purpose animals. We do not regard them for their meat alone, nor solely for their wool. Their yielding of two products, both of which are highly desirable, will ever factor in holding them in a position where they will command a profit for their owners.

But all the conditions enumerated as signifying the importance of the farmer's flocks presuppose that these flocks be well cared for and well managed. One of the largest sheepmen in the United States says: "If any observant investigator visits the sheep barns at any of our large markets he will realize that the average farmer having sheep does not understand how to keep them thrifty. The great number of decrepit old ewes, and untrimmed, stunted and emaciated lambs one sees is sufficient evidence that something is wrong with sheep raising on the farms. One's first thought at the sight of the sorry looking assortment he finds on the market is that the owner was wise in getting rid

of them. 'Out of sight, out of mind.' But the poor outcast animals bear with them from the farm to the market ample evidence that, although once 'in sight' they were not in mind." Continuing, he says: "Does the grass grow in the meadow, or the corn in the field as luxuriantly when no thought is given to its cultivation? Will the cow give as large a quantity of rich milk, the harness horse hold his head as well and exhibit action, or the draft horse pull as great a load if their breeding is not carefully considered, and if they are not given good care? No indeed. It is not possible that Bacon had in mind the marketing of native sheep and lambs when he wrote, 'I will not offer that which I cannot master' or he would have written, 'I will offer that which I cannot master.'"

The words I have quoted are from a broad minded business man who handles thousands of sheep every year. His words sound pessimistic, but I know him to be an optimist. Later on in his discussion, he softens in his mood by saying, "Perhaps sheep raising on farms as an industry, is too young to have become established on a scientific basis. This being true, I think we may consider it partly, at least, on account of the instability of the sheep industry in the past and partly because the farmer operates on a large scale and often has neither time nor inclination to give sheep the proper attention."

In these latter statements I believe he has embodied much of our real difficulty. In placing sheep on our farms we try to apply the treatment to them common to sheep husbandry 25 or 30 years ago when there was little demand for mutton; when we were not so much interested in growing marketable lambs as now; when internal parasitic diseases were uncommon; and it was much easier to keep sheep healthy than now. We are still prone to listen to the old traditions to the effect that sheep do not need care and attention. Turn them in the woods, salt them occasionally, but leave them to themselves most of the time even without water, comes as welcome advice to the ever busy farmer. We like to believe that we can pick up a worn down flock of animals and put them on our fresh lands where they cannot help but get fat and prosper.

Here is where I believe we begin to pave the way for disappointment and loss in many of our farmers' flocks. I believe not only in good care taking, but also in exercising the greatest care possible in the selection of healthy foundation stock. By all means buy nothing but healthy ewes. I am referring particularly to ewes free from infestation of internal parasites. Of

these parasites, the stomach worm is the one to be most dreaded here in the corn belt. When it and the little fellow which causes the nodules on the intestines combine in their attack on the flock it is a sorry day for the shepherd, because these in combination will kill mature sheep.

It was not only a depression in prices that drove many of our corn belt farmers out of sheep in 1894-5-6, but also the widespread attack of the stomach worm. It was a new enemy to us; we knew absolutely nothing about its control, and its destruction was awful. I remembered that in the summer of 1894 my father had 40 beautiful Shropshire ewe lambs. They began to fail, and soon after began dying. We nor none of our friends knew what to do for them, and all but one died. There were many such experiences here in Indiana and neighboring states, and we cannot blame such people for being shaky about the sheep business. Since those first disastrous years we have had many ups and downs with the stomach worm. We have tried to trace its life history; we have tried to clutch it in our control, but we have been only partially successful. However, I am optimistic enough to believe that we shall learn how to control this dreaded pest. But its approach is so stealthy, and its attack so deadly that it is best for us to do our best to keep it entirely off our farms. The beginner who has a clean uninfested farm—one on which no sheep have been kept for several years—has a great opportunity for establishing a clean flock, of which he should certainly take advantage. When our Illinois constituents ask for advice upon establishing a commercial flock, I suggest that they buy grade Merino ewes direct from some western range where internal parasitic diseases are comparatively unknown. These ewes may not be exactly to the beginner's liking in type and conformation, but he can well afford to sacrifice some of his ideals in this direction for the sake of health. By the use of good sires he can soon build up a grade flock which he will like. It should be remembered, however, that the selection of healthy ewes does not entirely safeguard against infestation. If an infested ram is turned out with these ewes, infestation is soon spread through the entire flock, and all the work put into the selection of healthy females is lost. It is rather difficult to be fully assured as to the ram's health, because so many of our pure bred flocks are infected, and I believe it is a good plan to not allow him to run with the ewe flock. The ram can be turned with the ewes in a small dry lot at night during the breeding season, and for the remainder of the time kept in

quarters well away from where the ewes are allowed to run at any time. But this is not all. The stomach worm infests cattle the same as sheep, although they rarely have as much infection because they do not graze as closely. In fact it is not a menace to the health of our cattle. However, were I endeavoring to keep my flock from parasitic infection I would not introduce cattle to my pastures from farms where I suspected infected sheep were kept. Perhaps you will think me extreme in my views concerning keeping the flock free from these parasites, but if you have noted the difference between the infected and the uninfected as I have, I believe you will pronounce my advice sound.

Perhaps you will say all this precaution involves too much work and care. Well, I am not one who believes that sheep require no care. But if you will be consistent and not allow the stomach worm to come in by throwing down the bars somewhere, I believe this precaution will involve less labor than a great deal of trying and discouraging work over unhealthy animals.

External parasites can be easily controlled by dipping and hence should be no cause for worry. Aside from parasitic infection, I believe the health and thrift of the flock is best maintained by endeavoring to keep them under regular and even conditions. An abundance of fresh air, dry footing, shelter from cold rains, or excessive rains in hot weather, and a screening from the hot sun, are about the best protection we can give them from the adversities of the weather.

It is not economy to let the flock become low in condition of flesh. Low condition is unavoidable at times because there seems no way of keeping some good milking ewes up in condition during the suckling period, but what I mean is that it is a mistake to get sheep so low in condition that they fail to display thrift and vigor in their movements. After the lambs are weaned one of the best ways to have ewes recuperate in condition is to give them a chance to graze over the lots, stubble fields and other parts of the farm which are generally overlooked as feeding places for animals. The breeding ewe should at the beginning of winter be in good condition, as evidenced by a wealth of firm flesh, bright, elastic wool, pink skin, and active vigorous movement, and she should be fed enough to keep her up in condition as the lambing period approaches. There has been considerable dispute as to whether ewes should be allowed to graze on the pastures during the winter months. Our Canadian brethren and those in northern states such as Michigan and Wisconsin advise decisively against it. They say the frozen herbage is not nourishing and that it in-

roduces digestive troubles and may even cause abortion. An acquaintance who is a successful sheepman in central Tennessee tells me that their flocks depend largely on the winter pastures. We are rather in the in-between locality and undoubtedly there are times in winter when our ewes should not be on the fields, but much of the time it seems beneficial rather than detrimental for them to be there. The grazing may not do much toward maintaining the ewe, but it induces much exercise, which is secured in the most beneficial manner as it is taken in a leisurely, rambling fashion, which I think is more efficient than a drive of a mile or two down the road and back to the barn again. And I am not so sure but that the ewe gets a great deal of her maintenance from the old clover field or pasture, which is to go into corn in the spring. Experimental data on this point are not available. But it is a field well worthy of our investigation. Perhaps the evil of running the ewes to these fields lies in our making them depend entirely for their maintenance upon what they find there. This I do not advocate as a practice. There may be instances where expansive and luxuriant pastures have lain idle through the summer, especially for winter use. These of course are feeding grounds, but they are not natural to the average farm.

Before lambing healthy ewes rarely need more than one-half pound concentrates or grain per head per day. If the roughage used is about two pounds of clover hay per day this grain can be a mixture of corn and oats equal parts by weight. If corn fodder is fed, then 10% of the concentrates should be nitrogenous in nature, such as linseed oil meal and soy beans. After lambing time, the ewe should be fed more liberally. The grain ration should be gradually increased to a pound per day, and she should be given all the roughages she will eat up clean. If possible some succulent feed should be introduced at this time. Our English cousins give the ewes suckling lambs all the roots they will eat. With us good corn silage serves better because if carefully fed it answers the purpose and it is cheaper than roots.

In sheep feeding we should attempt to give them a variety of feed, and especially after the lambs have arrived. By variety is not meant one thing today, another tomorrow and still another the next, but a mixture of several feeds. And in the introduction of a new feed for the sake of variety, the introduction should be gradual, because sheep are very susceptible to sudden changes. It is a matter of economy to keep the feeding quarters of sheep clean, because they will refuse to eat soiled feed. It is also a matter of economy to not feed more than they will eat up clean.

Here many err in thinking that the stems, for instance, of good bright clover hay are not edible, and hence they feed enough to satisfy the appetites of the sheep without eating these stems. At the Illinois Experiment Station in feeding experiments with fattening Western lambs we have kept a record of the hay waste. With choice western alfalfa less than 2% of the total amount fed was weighed back. Think of it—less than two pounds out of every one hundred that was not consumed. With Illinois grown clover hay about 7% was weighed back. This was mainly coarse weed stems, old corn stalks, lumps of earth, etc., all material evidently of no nutritive value. These lambs were in the best of health during the feeding period, and in feeding breeding ewes, there is no need whatever in wasting the stems of the clover hay of good quality.

It is a mistake to make the flock entirely dependent on the pastures in the early spring, because the grass is lacking in nutritive value at that time. If it is advisable to turn on the pastures it is better to supplement the grass with a little clover hay or possibly grain.

The lambs should learn to eat grain before they are turned on pasture, and if they are intended for the early summer market they should be given some grain all the time they are on grass. It not only secures better gains, but a better market finish, and prepares the lambs to withstand the shipment to market. Two or three years ago a prominent buyer on the Cincinnati market made a sharp distinction between lambs appearing on that market from southern Indiana and those from Kentucky. In breeding and age they were similar, but those from Kentucky were much superior in finish when they reached the market, and principally because they had been fed grain while on grass.

We have all heard the doctrine that sheep should be changed often from pasture to pasture. It is good doctrine too, but its efficacy has sometimes been overemphasized, and especially in those cases where it has been claimed that it will eliminate eradication of internal parasites. It will very likely hold this infestation somewhat in check but it will not stamp it out. During hot weather the egg of the stomach worm, especially, hatches out in a very few days after being voided in the feces, and it may live several weeks or perhaps months. I am inclined to think we would improve our grazing not only for our sheep but for all of our farm animals if we were to sow a mixture of seeds. In this way we would always provide variety. They do that way in England, and the English farmer believes that it pays well. On an English farm I

was shown one of the most luxuriant pastures I have ever seen anywhere, and magnificent Shorthorn cows and aristocratic Cotswold sheep were reveling in it. I was told by the farmer that he sent a description of the field and the use to which he wished to put it to his seedsman and asked him to prepare the mixture of seed for it. Dr. Van Doren, a neighbor of mine, and a feeder of sheep for the past 15 years, always sows a mixture of red clover, white clover, red top, orchard grass and timothy. He never fails to get a setting of grass, and he considers it absolutely essential to his scheme of feeding sheep in the open, at which process he is very successful. And a mixture of this sort, while not ideal for hay, is better than a cutting from a poor stand where rag weeds crowd in to add their full quota to the dustiness of the product.

Aside from proper control of the health and feeding of our flocks we can do a great deal toward securing profits by the careful selection and reservation of breeding animals and in the preparation of the lambs for market. The need of selecting healthy breeding animals has been already emphasized, but there are other factors to be considered. The breeding ewes should be well grown, strong in constitution, with large capacious middles. They should be well wooled with compact fleeces to protect them from the unfavorable weather. Their wool should grade from $\frac{1}{4}$ to $\frac{3}{8}$ block combing, because wools of these grades always sell well in the grease, and they are also grades that are likely to yield heavy fleeces. It should be remembered that the wool is no inconsiderable item in determining the profits from the flock. The ambitious farmer should strive to keep ewes that will shear 9 to 10 pounds of good marketable wool. And in this connection I should like to recall the range Merino ewe already spoken of as being desirable because she is healthy. She is also desirable because she is naturally hardy, and more than that, she is a good shearer, and what is better still, she raises an excellent mutton lamb when crossed with a good mutton sire. In view of these things, I am forced to the conviction that sheep husbandry in our corn belt would be improved if more Merino blood were used in the commercial flocks. On the part of the adherents of the mutton breeds there is a prejudice against Merino blood. Through the mutton man's eyes it must be admitted that the Merino is not handsome, and I doubt if the little old, wrinkly type of Merino should be given an opportunity to diffuse his blood through our flocks; but for the large bodied, smoother type I think there is a place. Understand, I am not arguing for pure Merino flocks, I doubt seriously if they are what we want, but I believe a fusion of Merino and mutton blood would do us good.

After the foundation flock is selected there will, after a time, be rejected ewes that prove to be weeds, and those that grow too old to be of further service. A ewe proves to be a weed when for any reason she is unprofitable to keep. It may be that her fleece is light, or that she suckles poorly or fails to produce good lambs regularly, or perhaps not at all, or that she fails to produce until very late in the season after the main crop of lambs has been born. What we want is a flock of ewes all of them good producers, good sucklers, and all giving birth to their lambs at about the same time. If a ewe fails in any of these requirements she should be dropped out of the flock no matter how pleasing she is in appearance. Her place should be filled by a young ewe that was born at a time in the year when the main crop of lambs is wanted, for a late born ewe lamb often proves to be a later breeder herself. This young ewe should be from a regularly producing and a good suckling dam. In the ordinary flock it should be possible to keep track of mother and offspring sufficiently to make such selections.

We often fail to realize the advantage of having the lambs all born at about the same time. It is better from the standpoint of the labor involved as any shepherd of experience will tell you. While the lambs are coming there has to be special arrangement and provision in the sheds. There should be night vigils of expectancy for the little ones, particularly if the weather is cold. No shepherd welcomes a long period of such watching. Uniformity of age makes a long way toward uniformity in growth and condition of the lambs, and these are very important factors in marketing. I have seen pure bred flocks and in this state, too, where the first lamb appeared in February and the last in June. Many ordinary grade farm flocks are guilty of the same practice. If you are skeptical, go to Chicago market and see the consignments of native lambs. If our offerings are very uneven in age it is sure to work harm to their market value, and we should guard against it by having our ewes lamb at about the same time, as I have suggested. Remember, however, than unevenness in the age of the lambs may not be the direct fault of the ewes. They must be properly conditioned for the breeding season and they should be mated with well kept, active, vigorous rams. Otherwise, we cannot reasonably fault them for failing to breed at the time we would desire them.

Salesmen and buyers on the great open markets criticise the selection of breeding rams by producers of natives in stinging

terms. Why? Because they see them come to the open market and select for breeding purposes the indifferent kinds of rams found there. Rest assured, gentlemen, that the ram which has good backing as a breeder, or even prospects of being a good breeder, rarely finds his way to the open market. As a rule, the rams on these markets are grades—you know nothing whatever of their history. You buy them and mate them with grade ewes. There is a warfare of various bloods, and none sufficiently prepotent to dominate. Result,—a crop of lambs made up of strikingly unlike individuals, and a laughing stock for the community. It always pays to buy the pure bred ram that unmistakably shows the development you would like to see in your lambs. Do not pass over your neighbor who is breeding good ones, and take a scrub from the open market because he is cheap.

The open market finds fault with the producers of native lambs because they are indifferent to the need of having their lambs fat before sending them to market. We should remember that a lamb cannot grade prime if he is not fat. We should learn how to determine whether a lamb is fat. Go over your lambs with your hands. If the spine and ribs are prominent as revealed by the touch, it is a sure indication that they are too low in condition to grade high on the market. In general it does not pay to market healthy lambs until they are at least in choice condition, and those who produce them should realize the importance of this fact fully as well as the growers of pigs realize it pays to have them fat before marketing.

The majority of the growers of native lambs neglect to castrate the ram lambs. The market denounces this neglect in unmistakable terms. Some growers are ignorant of the fact that "buck" lambs are not as desirable as wether lambs; others are afraid to castrate because of probable losses from the operation, and thus thousands of "buck" lambs reach the markets each year. When these lambs are no more than 2½ months old, they begin to develop a coarseness which increases rapidly with age. As their sex instinct develops they become very active at teasing the females in the flock and at fighting among themselves. By this activity they not only reduce themselves in flesh, but all others in the flock. They become large and coarse in frame, and thin in flesh, a combination that places them in the cull grade when they reach the market. In many instances they show the breeding and the care, such that, they would have graded as choice had they been castrated early in life. During the latter half of the summer season these "buck" lambs sell for at least

one dollar a hundredweight less than choice lambs. On a hundred lambs averaging eighty pounds, this represents a loss of eighty dollars, not taking into account the loss of flesh which results from the fretful activity of ram lambs. Through the head buyer of a large packing firm in Chicago, I learned of a firm, Messrs. Hall & Campbell, Shelbyville, Kentucky, that makes a practice of contracting a large number of lambs each season with the privilege of castrating the ram lambs. This firm has built up an enviable reputation for the superior quality and finish of the spring lambs it sends to market. *and then* The writer sent the following questions to Messrs. Hall & Campbell, and the subjoined letter, which is a reply to these questions, illustrates how well it pays to castrate ram lambs intended for the meat trade. The questions follow:

First. How long have you followed the practice of castrating the lambs you contract for early in the season?

Second. At what age do you operate on the lambs?

Third. How much do you think it improves the quality and value of the lambs?

Fourth. Is this very high quality for which your lambs are known due principally to docking and castrating, or do you see to it that the lambs are given better than usual care in the way of feeding; and are they bred directly with a view to producing prime lambs?

Fifth. Has your practice awakened the growers in your section to the fact that it is very necessary to castrate ram lambs if they are to be made prime for the market?

Shelbyville, Ky., Aug. 22, 1908.

W. C. Coffey, Urbana, Ill.:

Dear Sir: Your letter in regard to the castrating of lambs received through Mr. Embry, and we take great pleasure in giving you what information we can. We have been castrating the lambs which we contract for early in the spring for fifteen years. We castrated only a few at first, as people were afraid it would kill them. We agreed to give them three dollars per head for all lambs we killed by castrating. At the present time the majority of the best farmers in our section castrate their lambs.

We sell our lambs for fifty to seventy-five per hundredweight higher any year than those who do not practice castration. As far as quality is concerned there is no comparison. It makes us sick to go among a lot of buck lambs and attempt to select a good load. A lamb should be castrated when he is a few days old; however, since we have the greater part of it to do, we do not get to many of them until they are two months or more of age. There is

no more art in castrating a lamb than there is in castrating a pig or a calf; just cut off about one-third of the sack, pull the testicles out and let him go; the sooner you get through the better.

We think the quality is principally due to castration. They are bred and fed the same as other lambs. We would be pleased if you could manage to see a lot of them. The best farmers here would castrate their lambs were they to get no more for them than people who do not practice castrating. They would follow the practice because they can keep castrated lambs as long as they please, and they will grow and fatten if they are liberally fed. Not so with buck lambs. After a certain time they go backward until they become comparatively worthless.

If there is any further information we can give you we shall gladly do so.

Yours truly,

Hall & Campbell,

Emil Nearly all of the lambs in the locality where Messrs. Hall & Campbell purchase are marketed in the early summer before the lambs are old enough to have the sex developed to the same extent as is characteristic of the general run of native lambs on the market, and yet their letter is strong evidence that it pays well to castrate lambs that are to be marketed at a comparatively young age. Over and over again have the various live stock journals told the public that "buck" lambs are discriminated against on the markets, and yet they seem to be as prevalent as ever. Thousands of dollars are lost in the flocks of the central states through their owners neglecting to castrate the ram lambs. Each year the market cries louder than ever before against the cull "buck" lamb, which means that he is more sharply discriminated against as years go by. Hence every producer of native lambs should awaken to the unfavorable standing of the "buck" lamb, and also to the fact that with very little work and small risk this same lamb can be castrated and thus be made much more desirable for the meat trade. *

At the present time many owners of small flocks are at a decided disadvantage in marketing their lambs because so few of their neighbors keep sheep. When the grower is ready to offer his little handful of lambs there is not a sufficient number like them in the community to make up a shipment. The owner is at the mercy of the local buyer and the local buyer, in turn, cannot handle such a small offering to advantage. Therefore, if you keep sheep encourage your neighbor to do likewise; build up a community of sheep owners. Breed for the type of sheep best suited to your condition. Make a good product. If you do, the large

central markets will find you; you will have no trouble in disposing of your product. You will have no reason to complain of the lack of profits. Such communities will cooperate in eradicating their common enemies, such as the worthless cur, internal parasites, cockle burs, and shiftless methods of handling generally.

Mr. McCray: I think that all loyal Hoosiers will concede that Illinois is the second state in the Union, and I think we will also concede that Prof. Coffey comes from one of the best agricultural schools of the world. We are very grateful to him for his talk.

The next number is "The Horse Industry in Indiana," by Mr. C. N. Arnett, of Purdue University. We are all interested in horses, and I am sure Mr. Arnett has something interesting to say on this subject.

THE HORSE INDUSTRY IN INDIANA.

C. N. Arnett, Purdue University.

The climate, soil, crops, and methods of farming of Indiana are all quite favorable to the horse breeding industry, in fact, generally speaking, our conditions are very favorable and well adapted to horse breeding. The winters are only moderately severe and long; the extremely hot period of the summer season is quite short. We have, broadly speaking, a soil, particularly in the south and central portions, containing more or less limestone which gives us the most ideal soil for horse growing. Corn and wheat are the principal grain crops, yet oats, clover, timothy, blue grass and alfalfa are very common. So from the standpoint of crops, i. e., feeds to grow and maintain horses upon, our locality is second to none.

Looking at the question from another standpoint—from the location relative to desirable markets we certainly have unusual advantages in this respect. To many, this may seem a minor point but when we consider that the city trade, also the farm trade, in sections where they do not grow their own animals, is supplied through the central markets, we can easily recognize this advantage. Freight and feed bills enroute soon reduce the net profit on any class of stock to the minimum. Indianapolis horse market is good and is quite centrally located. No part of the state is beyond easy reach of Chicago, one of the largest markets of the United States. St. Louis, Buffalo, and Pittsburg markets are of easy access when our location is compared to that of many of the western states. In our own state we have several smaller markets and sales companies as at Wabash, Lafayette, Anderson, etc., that make it possible for one to dispose of horses directly and satisfactorily and with a minimum expense.

You will all agree with me in that the importance of the horse industry cannot be easily overestimated. At different times in the past few years people thought the days of the horse were numbered—bicycles, gasoline and steam motors taking their place. True, the motor has affected the demand for roadsters and carriage class of the horse but not to the extreme extent that was predicted. The heavy motor trucks have been discarded by many of the large companies and one is safe in concluding that horses will always be in demand and demanded in large numbers.

The State Statistician's report for 1908 shows that we had 635,342 horses and 83,934 mules in the state at that time, making a total of 719,276 head. It is impossible to place a true valuation

of the horse stock but placing it at a very conservative figure of \$75.00 per head we have \$53,945,700. Giving them a valuation of \$100 per head, which I myself consider low, we would have \$71,927,600 invested in the horse stock of the state.

On the Chicago markets of the same year, 1908—92,138 head of horses were sold with a total valuation of \$14,260,000. This, of course, includes all classes—

Drafters averaging	\$180.00
Carriage pairs	450.00
Drivers	156.00
General use	129.00
Bussers and trammers	138.00
Saddlers	164.00
Southern chunks	69.00

These figures are interesting and valuable in so far as they show the relative value of the different classes of horses and the large sums of money that are paid back to the producers.

In order to see something of the condition of the horse breeding industry in Indiana let us look at a few more figures from the State Statistician's report. In 1908 there was reported 279 head of pure bred draft colts under 1 year of age; 185 head 1 year and under 2; 244 head 2 years and under 3; 1381 head three years and over, giving a total number of 2089 head of pure bred draft horses.

By comparing the numbers by ages we are forced to conclude that quite a number of our pure bred draft horses are foreign bred. It is quite true that we had to get our start for the various breeds in their respective homes but it is time that we were producing larger numbers in our own country.

Indiana has long been recognized as having a foremost place among other states in the production of trotters and Standard Bred horses. Figures show a total number of 2234 head in the state in 1908. Thus we see a larger total number of trotting bred animals than we have of pure bred drafters.

Today our state is quite overrun with the small to medium sized common type of horse. There are several reasons for this state of affairs and they are almost too well known to need mentioning here,—

First, high prices have taken too many of the good heavy mares into the city.

Second, the coach horse craze of a few years back when the farmers bred almost altogether to the coach horse trying to produce a carriage or general purpose type.

Third, a lack of appreciation on the part of many of our people for good horses.

True, we have in our state some of the largest importers of foreign horses that are in the United States, J. Crouch & Son, at Lafayette, Souers, at Huntington, Maywood Company, at Indianapolis, and Wolf, at Wabash.

Besides these we have several breeders of pure bred draft horses of all the breeds as well as several quite prominent breeders of Standard Bred horses. So Indiana people have had an opportunity to use some of the best horses in the country but simply have not taken advantage of their opportunity.

To use an English expression American people are not "horse proud" and I am compelled to admit this is true in general. In order to better our conditions and improve the kind of horses in the state, there are several things necessary.

First, the people should have a better knowledge or in other words, should more keenly appreciate the value and place of a good horse. A careful study of horse breeding from a business standpoint on the part of our farmers would show that horse breeding, conducted on right and sensible plans, is a very profitable business. The fundamental principles underlying horse breeding are essentially the same as for other classes of live stock. The breeder must be in sympathy with his business and be a good, keen judge of the type of horse he desires to produce. He should have a good understanding and knowledge of the market demands and market classes of breeding grade horses. When breeding pure bred animals which he expects to sell for breeding purposes, then the breed type and blood lines, as well as the desirable individual characters should be thoroughly understood.

A large percentage of the draft horses that are imported into this country are bred by the small or tenant farmer of their respective homes and is one of their most substantial sources of income. Our conditions and environments are most certainly as favorable to horse production in every respect and our farmers certainly have a decided advantage over the foreign farmers in many respects. So we will all have to admit that it is our own fault if we continue to import our breeding stock for many more years. I myself do not think that our people can or will improve and correct their methods of horse breeding by themselves. It will be necessary for some government or state assistance before there will be the same incentive to build up and maintain desirable and creditable breeding studs as are found abroad. In France and Belgium the respective governments have long given premiums

at certain shows, also subsidized animals that are of certain merit. Besides this, these countries have very rigid laws that discriminate against undesirable breeding stallions. In the United States the various states are taking this matter in hand and now some sixteen states have passed stallion laws and I myself consider this one of the most necessary and essential steps that could be taken in Indiana toward the bettering and improving of our horse industry.

So far as I can see there is every reason why we should have such a law in Indiana and no good reason for not having. It is not my purpose here to even outline a stallion law in full nor can I take the time necessary to talk at any length on any one of the several benefits our people would have and enjoy when their work would be protected by such a measure, but I do want to call attention to some of the more necessary features of such a law and a few of the results we could expect.

A stallion law should compel the owner of every stallion or jack offered for public service to publicly advertise the true breeding of his animal, i. e., pure bred, cross bred or grade.

It should also provide for the registering of each stallion or jack with the state board and stipulate a certain fee to cover the expenses of the same. In most states where they have such a law, this fee is \$2.00 per year.

The law should embody a list of unsoundnesses and diseases that would render the stallion or jack unfit for breeding purposes.

To some, when the fact that few diseases are directly inherited or transmitted, this may seem going too far but any doubt along this line may be completely cleared when we know that the offspring from a diseased or unsound parent usually has a predisposition to the same disease or unsoundness. A few of the diseases and unsoundnesses that should be included are:

1. Blindness (when due to disease of any kind).
2. Heaves and broken wind.
3. Chorea (St. Vitus' Dance, crampiness, shivering, string halt).
4. Bone spavin.
5. Bog spavin.
6. Ring bone.
7. Side bone.
8. Navicular disease.
9. Curb (when due to conformation).
10. Glanders, urethral gleet, mange.

11. Any abnormal development of different parts and these should be specifically stated.

I give this list of unsoundnesses and diseases merely to give an idea of the ground the law should cover in this direction. It would doubtless be desirable and necessary to add to this list several of the more common diseases but I consider this sufficient for our purpose today.

The law should provide for a competent and conscientious examining board to pass upon the soundness of the stallions and jacks throughout the state and whose decision should determine whether or not the said animals are to be discriminated against.

These points, with a fixed penalty for disregarding the law are the more essential features that should be embodied in a stallion law. Such a law would doubtless work a hardship upon some few individuals but this is far overbalanced by the advantages and protection it gives to the many.

By such regulation the farmers and small breeders would know definitely the kind and quality of animal they were using and would be materially aided in their selection of the stallion or jack they wanted to use. In brief, it may be taken as an insurance to the breeder against fraud as has been and is now practiced by many stallion owners.

In case the Indiana Legislature does not pass such a law, one can easily see just what the result will be when all our neighboring states have such regulations for their horse breeding industry. Indiana will be, and is now to a certain extent, the dumping ground for all the undesirable, unsound, and rejected stallions and jacks from these other states. The longer we delay in taking this step, the more complicated is our problem going to become for the number of animals that would be discriminated against will steadily increase for the reason I have just mentioned.

Much could be said, in fact, several talks of this length could easily be made upon the different points and phases of the Horse Industry of Indiana but such must wait until another time. Now I wish only to briefly sum up some of the points I have touched upon and ask you as individuals and as members of the Indiana Livestock Breeders' Association to carefully consider these problems and think over them after this meeting is closed.

1. Indiana is particularly well adapted to the production of horses.

2. We have a large number of horses in the state but many of these are small and undersize.

3. Indiana people have easy access to the very best horse markets, both central and local, that are to be found in the United States.

4. That horse breeding is a substantial and profitable business.

5. That we have some of the largest importers and breeders of horses in this section of the country.

6. That the people should appreciate more thoroughly the points of a good horse and method of judging.

7. That a stallion law is one of the most important means by which we can improve the horses in our state.

Discussion.

Mr. Edward Springer: Do the imported horses, as a breeding class, come up to the standard of what they ought to be?

Mr. Arnett: No, I do not think so.

Mr. Springer: What is the cause?

Mr. Arnett: One cause is the fact that the imported horses are not acclimated to our conditions. They have been raised under different conditions. Another reason they do not come up to our expectations is the fact that the imported stallion is mated with our ordinary mare, and their pure breeding has less effect on the offspring than we expect. In fact, the better blood of the stallion may be counterbalanced by the common blood of the female in many cases.

Many of the imported horses are not what they should be as individuals or in breeding. The good horses of France, Belgium, and England do not find their way to our country in large numbers, indeed, we cannot go there and buy the best horses, because the government has made it worth while for the people to hold them. Last year the 1st prize horse at the London Shire show sold for \$18,500 to stay right there in England. We cannot afford to go over there and buy horses of that quality.

Mr. Springer: In other words, the importer usually fetches the "scrubs."

Mr. Arnett: Importers bring over many of the ordinary class of horses, in a great many instances, and simply because he is imported, our people think he is all right.

A Member: What breed of draft horses produce the strongest offspring?

Mr. Arnett: I could not answer that. Any pure bred horse of the Shire, Belgian, Percheron or Clydesdale should produce good strong offspring.

A Member: Not so much the individuals as the offspring. The one that gets good offspring.

Mr. Arnett: You will find in a good many cases a poor, undesirable looking animal will produce a desirable foal. The fundamental principle of horse breeding is very much the same as that underlying the breeding of all kinds of livestock. The fact that like begets like is the only thing we have to depend upon.

Mr. H. E. Lochry (Franklin): Do you not think there would be more interest manifested in draft horses if there was only one breed in a certain locality?

Mr. Arnett: I do, yet some prominent breeders do not. A man will bring in a Percheron stud one year, and after keeping it two or three years he will go out and buy the first thing he can get, and this mixes the breeds. Take a certain locality, and if the farmers in that locality would decide on a certain breed of horses and stick to it for a period of years, there is no question but what they will make very rapid and satisfactory improvement in the horses of their section. If one man cannot afford to buy the kind of a stallion he wants, let two or three or four go together and get what they want. But the trouble is to get people to co-operate. If a man wants a Percheron, he will go where he can get it, and if certain localities were noted for a certain breed, it would certainly advance the horse industry of Indiana.

Mr. McCray: Prof. Skinner has some announcements to make.

Prof. Skinner: I just want to call your attention to the fact that all these addresses will be published in the annual report of this Association, and we would like to have a larger membership among the farmers and breeders than we have. Last year we had thirty-four, but we ought to have thirty-four hundred to make this Association a strong, potential force in the upbuilding of livestock interests. The membership fee is only 50 cents, and that carries with it, to new members, the reports of 1908-09. Mr. Kurtze is in the rear of the room and will be glad to take any membership fees, names and addresses. The 1910 report will include the proceedings of the Swine Breeders' meeting and the Wool Growers' meeting. This report is worth more than the membership fee to one who has not been able to attend these meetings. I hope we will secure a large membership here today.

Mr. McCray: We will soon adjourn for dinner, but I want to call your attention to the excellent program we have for this afternoon. The first thing this afternoon will be the address by Prof. Wiancko on alfalfa, which will certainly be very interesting

at this time. This industry is in its infancy in Indiana, and we are all interested. We will also have a talk this afternoon by Mrs. Virginia Meredith, and as Mrs. Meredith's reputation as a breeder of fine stock is well known, I know this will be very interesting. I hope we will all come back this afternoon.

I will now announce the committees for the coming year.

Legislative Committee:

T. A. Coleman,
W. T. McRae,
W. J. Beckett.

Program Committee:

C. N. Arnett,
Clem Graves,
Edw. Smith,
Joseph E. Elder,
John Harcourt.

Resolutions Committee:

A. J. McDonald,
Frank VanNatta,
Joseph E. Elder.

Membership Committee:

J. H. Skinner,
C. A. Kurtze,
Thos. Vinnedge.

Adjournment.

THURSDAY AFTERNOON, JANUARY 6, 1910.

Meeting called to order by the vice president, Mr. Warren McCray.

Mr. McCray: We will now take up the last number of this morning's program, an address on "Alfalfa in Indiana," by Prof. A. T. Wiancko, of Purdue University.

ALFALFA IN INDIANA.

Prof. A. T. Wiancko, Purdue University.

Mr. Chairman, Ladies and Gentlemen: The subject upon which I am to speak to you is one that is rapidly growing in importance in Indiana, a thing which I think you, as livestock men, will readily recognize. Five years ago there were comparatively few people in Indiana who knew very much about alfalfa, and many did not even know it when they saw it. But that is not the case now. There are comparatively few who do not know more or less about the crop, it has been making such rapid progress.

In the Agricultural Department of the Experiment Station we have been making experiments to determine not only the best methods of sowing alfalfa, but to determine to what extent it is adapted to Indiana conditions. We have been conducting these experiments for the last seven years, more or less. At first we began in a small way with our students in the School of Agriculture when they went back home, but in the last four years on a larger scale in cooperation with farmers all over the state, and we have had from seventy-five to one hundred tests on as many farms each year during that time. The results of these experiments are what I want to discuss more particularly, and what I have to say to you about methods of establishing alfalfa is based upon what we have learned in this way.

I want to say a word first concerning the value of alfalfa and its place in Indiana agriculture at the present time. As you know, it is a leguminous plant, which has the power of gathering its own nitrogen, and for that reason is a good soil improver. It is not a clover, as so many people seem to think. Its large yielding power and its rapid growth make it particularly valuable as a forage crop. The yields of alfalfa as compared with clover under similar conditions, will be from two to four times as much in a season. You can count on an average of three times as much under similar conditions. Another thing which makes it more valuable than clover is its higher food value. Alfalfa has 11 per cent of digestible protein, while clover has less than seven. Some experiments in cattle feeding that I have in mind show that alfalfa is nearly equal to bran. One large feeder near Fort Wayne tried alfalfa in comparison with wheat bran through a period of several months, and his conclusion was that one ton of alfalfa hay was worth eighteen hundred pounds of bran, in his feeding to milk producing cows. It has, then, a larger yielding power, probably three times as much under similar conditions as clover, and

a feeding value perhaps one-third or even one-half more, pound for pound.

One of the things we experimented on was the adaptation of alfalfa to Indiana conditions. It is thriving in the Western States, and especially in the semi-arid states and where they irrigate they have been growing alfalfa successfully for a long time, and at the present time to a very large extent,—to such an extent in the states of Colorado, Utah, Kansas and Nebraska that they have come away up to the front as hay-producing states, just because of the alfalfa crop, and they first began its culture fifteen or twenty years ago. We found that the climate in Indiana is, as a whole, favorable to the crop. It is as favorable to this crop as to clover, after it is once established and has become used to the soil and properly inoculated. The greatest drawback with alfalfa here is that the bacteria necessary to its best development are not usually present in the soil, and many a man who tried alfalfa and failed on that account concluded that the crop was not adapted to Indiana conditions, when it was simply a question of introducing into the soil these bacteria which are necessary to its development. It is possible to grow a full crop of alfalfa on soil that is rich in nitrogen, without bacteria, but it must depend upon the soil for nitrogen, which, with the bacteria present, it is capable of gathering for itself from the air.

After concluding that the crop was adapted to the State, the next thing was to determine the best methods of establishing it, the best time of sowing, the best method of preparing the soil, the fertilization necessary, etc. The first thing to consider in that connection was the kind of soil to which it is adapted. Now, I want to call your attention to these charts. There is quite a lot of information on these charts, which show the result of the experiments conducted during the last three or four years,—most of them during the last four years. I have tried to show in these summaries not only the favorable, but also the unfavorable results, so as to give you a chance to compare them. Each of the summaries includes all the complete reports on the particular point under consideration.

In regard to soil, we found that it did not seem to make any difference whether it was light, sandy soil or the heaviest kind of clay. We had failures and successes on all types of soil. During the last four years we had such experiments on over three hundred different farms in different parts of the State. I do not think there is a county that we did not reach, and in that number of experiments we had quite a few of each type of soil represented, and here is a summary of the results.

Table I.—Relation Between Soil Type and Comparative Stand of Plants secured in Alfalfa Seeding Experiments. Summary of 268 Tests Covering Four Years, 1906-1909.

Kind of Soil	No. of Reports	Fair to Good Stand	Poor Stand
Clay	57	47, or 82.5%	10, or 17.5%
Loamy	141	125, or 88.7%	16, or 11.3%
Sandy	70	62, or 88.6%	8, or 11.4%

We had 141 reports on loams, which showed 125, or 88.7% of fair to good stands and 16, or 11.3% of poor stands. The clay soils gave us 47 out of a total of 57, or 82.5% of fair to good stands and 10, or 17.5% of poor stands. The sandy soils gave us 62 out of 70, or 88.6% of good stands and 8, or 11.4% of poor stands. The percentages, you will observe were practically the same for all three soil types and the inference is that success or failure does not depend particularly upon the type of soil.

The next chart presents a table showing the average percentage of winter-killing on these different soil types.

Table II.—Relation Between Soil Type and Amount of Winter-killing of Alfalfa. Summary of 158 Tests Covering Three Years, 1907-1909.

Kind of Soil	No. of Reports	More or Less Winter-killed	Av. % of Winter-killing
Clay	35	22	31.3%
Loamy	88	54	23.8%
Sandy	35	13	14.2%

We have here out of 35 tests on clay soil, 22 showing more or less winter-killing, and the average damage on these plats amounts to 31.3 per cent. Out of 88 plats on loamy soils, 54 showed more or less winter-killing, averaging 14.2% of damage. Here we have a considerable difference in favor of sandy soil. We would naturally expect that.

In looking for other conditions that might be related to the success or failure of alfalfa, we experimented with the drainage conditions and found that that is a very important factor. Another very important factor is the presence of weeds. These are the two most important factors in determining whether or not alfalfa

can be raised successfully,—**drainage and weeds.** These are the **two things that the farmer needs to give his attention to.** The type of soil does not matter so much,—we get poor results on all types. Good drainage is perhaps the first thing to attend to. A great many people do not realize just what we mean by good drainage. For the drainage of clay soil probably nothing short of good tile drainage will do. In some cases you have good natural drainage on the lighter loams and sandy soil, but good drainage, either natural or artificial, is necessary if you hope to be successful in the production of alfalfa. Alfalfa will not stand any continued wet. It will stand it for a few days, but not for long.

On the question of weeds, I may say that alfalfa when it is young is very susceptible to injury from weeds, and it is surprising how many weeds there are in a field when you sow a crop of that kind. A field that you never noticed weeds in will have so much foxtail and tickle-grass and crab-grass that you are surprised. So that to free the land from weeds is a most important thing in preparing the seed bed. That problem led us to undertake some experiments in sowing at different times of the year, and we soon learned that summer sowing was preferable to spring sowing because it gave the farmer a chance to get rid of the weeds. The next table clearly shows that to be the case.

Table III.—Condition of Summer Sown Alfalfa Plats as Regards Damage by Weeds, Summary of 195 Tests, Covering Three Years, 1906-1908.

Amount of Damage	No. of Plats	Per cent. of Total
None	157	80.5%
Little	35	17.9%
Serious	3	1.6%

Surface cultivation during the spring is a thing that we are most strongly recommending at the present time. Where the farmer can devote the land to the crop for a year before he expects to mow hay from it, he should prepare the ground as he would for any other crop by thorough plowing and then cultivate it and harrow it at intervals of about ten days or two weeks, and put all the weed seeds in good position for germination, get them to start, and then harrow again and kill them. Doing that three or four times will kill most of the weed seeds in the surface soil. Then the alfalfa can be sown. We usually take until about the

middle of June and sometimes longer, for this preparation. We do not recommend sowing before that time, but any time between that and the middle of August will do, if the seed-bed is in good condition. Sometimes we have a season of drought, and we have to wait quite a long time, but there is usually some time between the middle of June and the middle of August when you can get a good seed-bed. Sometimes we leave it too late, as was the case last year. The sowing was delayed until August and we had so much dry weather that it did not germinate.

On the question of time of summer sowing, I made some investigation as to whether we should prefer early summer or late summer. The question was, how late can we sow and still have time enough for the crop to make a good growth to enable it to pass through the winter, and it seems that there is not a very great deal of difference, as the table here presented shows.

Table IV.—Relation Between Date of Seeding and Spring Condition. Summary of 158 Tests Covering Three Years, 1906-1908.

Time of Sowing	Fair to Good Spring Condition	Poor Spring Condition
Before Aug. 15	74, or 70.6%	31, or 29.4%
After Aug. 15	38, or 70.1%	15, or 29.9%

The amount of growth will depend upon conditions other than the date of seeding. The fertility of the soil and the moisture supply after seeding have much to do with it, and especially the moisture condition. We have had seedings made as late as September as far north as Starke County, that made a growth of six to eight inches before freezing, and went through the winter in fine condition. Under other conditions seedings made by the 1st of August did not make enough growth to pass through the winter. There was not enough moisture, or the soil was poor and not favorable.

Now, as to the condition of the soil as to fertility. It would not be reasonable to expect alfalfa to grow on poor soil, because it is a very large grower and needs a large amount of plant food. You are cutting three times as much alfalfa from the ground as you would of clover, and one would expect it to take three times as much fertility. So soil fertility must be attended to. When inoculation is looked after this covers the supply of nitrogen, but

the supply of phosphate and potash and perhaps lime, must also be attended to and if not abundantly present must be supplied in the form of manure or commercial fertilizer. Alfalfa is a very heavy feeder of potash. We find that stable manure is the very best thing we can use, not only for its plant food ingredients, but because of its effect upon the physical condition of the soil and its effect upon inoculation. We found that manure, in addition to putting the soil in good condition, gave us a larger percentage of good stands. That you will probably have noticed in seeding clover,—wherever manure is used you have a better chance of getting a good stand than where manure is not used. The further benefit of manure in aiding inoculation is worth considering, even though you apply artificial inoculation. The manure itself is a sort of food for bacteria, and they develop better in soil that is well supplied with manure, so that even where inoculation was not applied, we had many cases where bacteria soon developed. The application of manure can be made any time. It can be applied the fall before seeding, it can be applied before plowing in the spring, and as a top dressing at the same time that you are giving the preliminary cultivation to kill weeds.

The question of liming soil for alfalfa is one that we have been studying for nearly three years now. We know that lime takes some time to show its effects, so we did not attempt to get any reports until after the second year, and I have here the results of the use of lime at the end of the second year. I summarized the reports on this point in the table presented here, showing the total number of reports, the number of plats that showed no difference between the limed and unlimed areas, the number in which the limed areas were better than the unlimed, and the number in which the unlimed were better than the limed.

Table V.—Effect of Liming Soil for Alfalfa as Shown by the Comparative Stand, Color and Degree of Inoculation
Two Years After Sowing.

Conditions Compared	No. of Reports	No Difference Between Limed and Unlimed Plats	Limed Plats Better	Unlimed Plats Better
Stand	23	18	4	1
Color	23	18	4	1
Inoculation	22	12 some 6 none	3	1

You will see that eighteen out of twenty-three cases showed no difference between the limed and unlimed; in four cases the limed was better than the unlimed. In one case the unlimed seemed to be better than the limed as regards the stand. As regards inoculation, twelve out of twenty-two plats showed some inoculation, on both the limed and unlimed areas, while in six cases there was none on either. In three cases the limed areas were better than the unlimed as regards inoculation. Where the unlimed area was best the bacteria were present on both. Of course you must remember that this is the result of only twenty-three tests and at the end of two years. The indications are that as far as getting the crop started is concerned, liming has no important influence on at least many of our soils. It is possible that later on the liming will show more effect, but I think that it is pretty safe to say that if it does not show any effect at the end of two years, it will not show it. Eighteen of these cases indicate that the presence of lime was immaterial. Now, then, I do not want to say that it is not wise to apply lime. It cannot do any harm, and it may do good. In another investigation dealing with the effect of liming upon hay yields we found that in certain cases important increases were produced and the average increase during the second year was upwards of 300 pounds per acre per cutting.

Table VI.—Effect of Liming the Soil Upon Yields of Alfalfa.

Summary of Reported Yields of Hay Two Years after

Applying the Lime. Season 1908. 14 Reports.

Average total yield, limed plats.....	4050 lbs. per acre
Average total yield, unlimed plats.....	3478 lbs. per acre
Difference in favor of liming.....	572 lbs. per acre

Season 1909. 20 Reports.

Average yield 1st cutting, limed plats.....	2454 lbs. per acre
Average yield 1st cutting, unlimed plats.....	2162 lbs. per acre
Difference in favor of liming.....	292 lbs. per acre

Where we recommend an application of lime, we generally say that it should be applied the Fall before, so as to give it some time to act upon the soil before the alfalfa is sown. If you wait until the alfalfa is sown, or just a little while before sowing, it may be harmful, especially if a large quantity is applied. Theoretically, it takes only a few days for the lime to expend its caustic effect and become incorporated with other things in the soil that are neutral in their effect, but it seems that because the lime is not fully pulverized nor equally distributed, this action does not go on so rapidly, so that we should allow several months, if pos-

sible, after liming, before we sow alfalfa. The rate of application of lime may be all the way from 500 lbs. to a ton per acre. Use air-slaked or water-slaked, the best is water-slaked lime, or hydrated lime, as it is often called. You can buy that on the market now. If you can apply it a year or so before sowing, ground limestone will answer the purpose, and you can apply a larger amount for the same money, but you have to remember that ground limestone is worth only about half as much as the burnt lime in the amount of actual lime that it contains.

A Member: How do you apply it?

Prof. Wiancko: We have applied it in different ways. It depends upon what we have at hand. The best way to apply it is with a broadcast fertilizer drill that has the tubes reaching well down to the ground, so that it will not blow too much. In most cases we have had to apply it by hand by scattering it with a shovel. In some cases we used a manure spreader,—a layer of manure and a layer of lime. But one of these broadcast fertilizer drills is the best thing to use. The ordinary fertilizer attachment on a wheat drill will do the work if the lime is in fine condition.

A Member: Would refuse lime do?

Prof. Wiancko: Very well. In fact we use what they call "forkings" at the lime kiln. It is the material that passes through the fork with which they pick up the lime that is sold as burnt lime, or "quick lime."

A Member: What about ground quick lime?

Prof. Wiancko: If you apply it some time before seeding it is all right. Its caustic effect will then be expended before the seed is sown, but if you apply it shortly before seeding you would probably injure the young plants. It is rather more difficult to handle, on account of its caustic qualities, than the slaked lime. Most of this refuse lime just mentioned is air-slaked by the time you get it.

Now, as to the method of seeding. We found the best method of seeding is to sow the alfalfa alone. This matter of using a nurse crop is largely a fallacy. The nurse crop requires moisture and plant food, and is more or less a detriment, particularly if the season is dry, because of the large amount of moisture it takes to make that crop. By sowing in June or later, we do not need any protection from weeds. The protection that oats or barley will give alfalfa from weeds does not amount to very much, and I would never recommend its use. If the alfalfa is sown alone on well prepared ground, it will make a rapid growth. We have

had cases where the alfalfa was sown the first week in August and a crop of hay cut off of it October 1st. I know a case near Marshall where August sown alfalfa grew so rank it had to be cut and removed before the end of September. It had been sown about August 7th.

Mr. Edw. Smith: Have you tried oats as a cover crop, and then cut it in the milk stage?

Prof. Wianeko: Yes, that is the usual practice where a cover crop is used,—to sow it thinly and cut it for hay when the oats is in the milk stage. But one of the chief objections to that, we have found, is that the alfalfa plants are suddenly exposed to the hot sun when this hay is cut, and a good many of them die right away. In sowing alone in summer on previously cleaned ground, the alfalfa sprouts and is exposed to the normal conditions right away.

We recommend eighteen to twenty pounds of seed per acre, and where possible it ought to be sowed two ways, that is, north and south, and then east and west; but that is not always possible nor practicable. We have used various methods of seeding. Putting it in with a wheat drill is one way and another is to broadcast it and harrow it in. Some people use a brush harrow. The method of seeding does not matter so much, but I think where possible the drill is preferable to broadcasting and harrowing, because with the drill you get all the seed covered, and there will be no seeds left on top that will not germinate, and that is particularly important in summer sowing because during the summer the surface soil is liable to remain dry, and it is safer to cover the seed deeper than in the spring, because the soil is warm to a greater depth.

Mr. Smith: Have you ever tried sowing to clover seed?

Prof. Wianeko: That brings up a question that I was about to forget,—the question of the preceding crop.

We have tried practically every crop grown on the farm—fifteen or twenty different crops, from timothy sod or blue grass, corn land, early potato land, and various kinds of cultivated crops. A great many of our seedings were made during the last half of July or first half of August on wheat and oats stubble that was prepared after taking off the wheat or oats. It does not seem to matter what the previous crop was. It is a question of soil fertility and the kind of seed bed that is prepared. Sowing in standing corn does not seem to be a good plan. We have only had about a half dozen really satisfactory experiments in sowing in standing corn. This is largely because the corn shades the ground so much that

it does not give the alfalfa a fair chance to make a large enough fall growth. Then, it is practically impossible to get a uniform stand in standing corn, and a uniform stand is very important.

A Member: Is it advisable to use commercial fertilizer?

Prof. Wiancko: It is to be recommended where you do not have stable manure, or not enough. As a supplement to stable manure, commercial fertilizer is to be recommended; and where you do not have stable manure, then a good commercial fertilizer should be applied. We have been using a commercial fertilizer with from 1 per cent. to 2 per cent. nitrogen, 6 per cent. to 8 per cent. phosphoric acid, and the same of potash, applying from 200 to four hundred lbs. per acre, according to the needs of the soil. It may be applied just before sowing or at the time of sowing. The small amount of nitrogen in that mixture will help the plant get a good start, and then of course we count on the plant gathering its own nitrogen later.

A Member: In regard to planting on stubble land,—you do not have a chance to kill the weeds.

Prof. Wiancko: In that case, plow the stubble land in July. There are very few weeds that will come up in late summer. The trouble with spring weeds, foxtail and tickle-grass, is past. There is very little trouble with weeds in late seeding.

Mr. Maurice Douglas: Would it do to sow red clover seed in the spring and then later sow the alfalfa?

Prof. Wiancko: I rather doubt it, because the amount of growth would not be very much, and you might better spend your time in killing weeds. Referring back to Table III, you will observe that out of 195 experiments we had no damage from weeds in 157 cases, or 80.5% of the whole. That shows that the risk of damage from fall weeds is very slight. A little trouble with weeds was shown in 17.9% of the cases, and serious trouble with weeds in only 3, or 1.6% of the cases,—that is, in summer or early fall.

Mr. Jordan: Following wheat, do you break the ground with a plow, or just disc it a little?

Prof. Wiancko: I think ordinary land would need to be plowed, but in lighter soil a thorough discing would be ample soil preparation. In some cases you may even do harm by plowing the ground. On some light, mellow soils you might have trouble in getting a firm enough seed bed if you plowed in July, intending to sow at once. Such ground ought to have a little time to sort of settle and pack down after plowing. I think one reason for failure with alfalfa has been that the seed bed, as regards compact-

ness, has not been properly handled. I think alfalfa needs to be handled something like winter wheat. You want the surface two or three inches, loose, and then the under surface, while you want it fine, should be rather compact. If it is too loose for corn, for instance, it is too loose for alfalfa. The roots seem to go straight down at once and don't spread out. It is better to have the roots well spread out early in the fall. It will stand the winter better.

Now, the question of inoculation. The inoculation of alfalfa can be effected in several ways. The way that we have been recommending more than any other is to get some soil from a good alfalfa field and spread it over the field you are about to sow. You can do that at the time of seeding, or some little time before or after the seeding. The best time is either at the time of seeding or before, so that the bacteria will be there to get a start when the young plants are ready. We have been recommending using from 200 to 400 pounds of soil per acre, scattered broadcast and harrowed in. There is one thing I want to caution you against and that is getting soil that has weeds in it. Otherwise this is the best method of inoculation. The prepared culture is all right if you can get good, live bacteria in it, but in the majority of cases you cannot be sure of that. The material you apply may have live bacteria in it, or it may not. In most cases it has not. That is, the method of putting up these cultures is not sufficiently perfect to insure good live bacteria.

A Member: What about getting soil from ground that grows sweet clover?

Prof. Wiancko: Soil on which sweet clover does well will do to inoculate alfalfa. The sweet clover bacteria are very similar to those on alfalfa.

Mr. Smith: Is that true of red clover also?

Prof. Wiancko: I think not.

Mr. Smith: How many experiments have you had on red clover soil? I think it is good.

Prof. Wiancko: You think that red clover bacteria will do for alfalfa? So far as we can learn, the red clover bacteria, while probably not a different species, are nevertheless not adapted to alfalfa, but I think they may adapt themselves in time. In the case of sweet clover bacteria it seems they adapt themselves the first season. Have you any definite information on that point, Mr. Smith?

Mr. Smith: Not enough to make a speech on the subject. But down in the southern part of the state on our farms, they grow alfalfa and grow it very successfully. This year they had four

crops, and in the three counties they had six thousand acres of alfalfa. I have not looked into this thoroughly, but what information I have gained led me to ask this question. Down there they do not inoculate at all. They are very successful, and the red clover seems to be as good as anything they can find. I think the nitrogen is about what the alfalfa wants to start with.

Prof. Wiancko: It may be that your soil is in good condition having been carefully cultivated.

Mr. Smith: We sow clover first and then turn it under.

Mrs. Meredith: It may not be pertinent, but I would like to know in what three counties of this state they have six thousand acres of alfalfa.

Mr. Smith: In Dearborn, Franklin and Ohio.

Prof. Wiancko: Inoculation has been shown to be necessary in less than one-half of our experiments. In over one-half of the cases it did not matter whether we inoculated or not. The bacteria seemed to be there. Out of 165 tests, 33, or 20.1% showed plenty of nodules present. In fifty-six out of 165 there were some nodules present. These were the conditions the first season. About 55 out of 100 cases showed that inoculation was not necessary, but it is a pretty safe thing to apply inoculation. It can do no harm, and the chances are just about equal that you will need it.

Table VII.—Natural Conditions as Regards the Presence of Root Nodules. Summary of 165 Tests Covering Three Years, 1906-1908.

Condition	No. of Plats	Per cent. of Total
Abundant	33	20.1%
Some	56	34.9%
None	76	45.0%

Mr. Pfendler: In getting this dirt for inoculating the soil, is there any danger of injuring the germs in the soil when applying it?

Prof. Wiancko: If soil is exposed to the sun and dried for a long time, there would be; but ordinarily the soil will be transported in a more or less moist condition and applied within a reasonable time. It would have to be dried by the sun a considerable time before harm would result.

There is one more table I want to call your attention to. It shows the cause of poor stands. We could not make out what

caused failures, as we had successes and failures under identical conditions so we made a special study of that. We classified the conditions that might affect it under the heads of **drought, rain, weeds and insects**. Then we divided this again as to clay soil, loam soil and sandy soil, and we found that on the clay soil, where we had six out of the thirty failures reported, they were all due to drought. On loam soil we had fourteen of the thirty failures reported, and they were all due to drought. On sandy soil, there were four failures due to drought, and one to a severe rain storm. Weeds and insects were in no case the cause of failure, although insects will injure it. Grasshoppers may injure it a good deal in August and September. We had other causes where chickens got at it, but we did not count these, because they were not ordinary conditions.

Now, the after treatment. Some of our people I think make the mistake of pasturing the alfalfa while still too young. It looks so nice and green in the early spring that they turn their livestock in on it, and the first thing they know it is injured to such an extent that they have to give it up. The animals nip the crowns of the plants too closely, particularly in the case of sheep and horses. Cattle and hogs will not pasture so closely. The alfalfa should be perhaps one season old, or two years from the time of seeding, before it is pastured, in order to give the plants a chance to establish themselves. The first year's growth, then, should rather be mowed. It should be mowed when the plants are about one-quarter in flower. That will usually be toward the end of May, in central Indiana. Then it should be cut again when the plants are again about a quarter in flower. The second mowing will usually come a month after the first, and the total number of cuttings may be as many as four under good conditions. You can count on three.

I would like to say a word in closing about the way we have conducted these experiments. We conducted them on small areas—quarter-acre tracts. In cases where liming was included we cut them in two and put a barrel of lime on half the plot, and left the other half unlimed. We compared these two areas for the data that we have on the chart here. We would advise that farmers who want to try alfalfa do it on a small scale. You may not cut it down to a quarter-acre, but I would advise a small area, an acre or two at most, until you know how to handle it. Many a man has made a mistake in going at it on too large a scale. It is expensive business. It costs for seed alone perhaps \$3.00 an acre; then of course, the loss of the land for a year means

something, and no one should go into it extensively until he knows what he is about.

Where the question of liming and inoculation are to be studied at the same time on a trial plot, we would recommend laying off the piece of ground in four parts, or four squares. You can take the plot and divide it in the middle first. Lime one half and leave the other half unlimed. Then at seeding time divide it the other way, and inoculate the lower portion and let the higher portion go without inoculation. Then you have four different sets of conditions. One area that is unlimed; one is not inoculated; one is unlimed and inoculated, and the other is limed but not inoculated. You will then find out whether you need lime or inoculation. The use of lime has been experimented with in neighboring states, and in Ohio they seem to find that lime is more important than we have found it in Indiana. In New York State they have experimented quite extensively with liming and inoculation, and they find conditions somewhat similar to ours. In regard to liming, it does not seem to be necessary to success in a great many cases, and with regard to inoculation it seems to be unnecessary in about one-half the cases. Where alfalfa has been grown before no inoculation is needed, and the time will soon come when the bacteria will be largely distributed and found everywhere. I thank you. (Applause).

Discussion.

Mr. Smith: Where is the best place to get seed?

Prof. Wiancko: We have bought seed at a number of different places, and I think the best plan to follow is to write to a number of seedsmen and ask for samples and examine them. We have done that in all cases. Sometimes we found better seed with one firm, and at other times better seed with another firm. Last year we bought our seed at home. Two years ago, in Toledo.

Mr. Smith: I was referring to where the seed was grown,—north or south. It has been hard to find where we could get good seed. A man comes from Kansas or Utah with trial seed, but the trouble is it is not suited to our conditions here. I think the Kansas seed is a little better than the Utah seed.

Prof. Wiancko: I might say that here in Indiana there is a firm that is handling this seed, the American Pure Seed Co., at Evansville. They test their seed for germination, and they put it up in sealed packages. It costs a little more, but I believe unless a man is capable of examining and testing his seed for himself it is better to buy from a firm of that kind.

Mr. Pfendler: Is there any bacteria on the seed?

Prof. Wiancko: Yes, but ordinarily not enough to effect inoculation.

Mrs. Meredith: Do you think the flower a better guide than the growth of the crown for cutting the hay?

Prof. Wiancko: No, I do not think it is; but the ordinary farmer will see the flower in passing along the roadside and will know it is time to cut without closer examination.

Mrs. Meredith: Is it not possible to hurt your alfalfa by cutting before the new growth has started from the crown?

Prof. Wiancko: No, I think not. The plant will stand that. There is danger in leaving it too long. There is a time when the new growth will not start so rapidly, that is when the plants get old. Then, too, the quality of the hay will not be so good.

We have tried to get some information as to whether or not seed can be successfully grown in Indiana, but so far as we can learn it is not advisable to produce seed unless it is the last season before you plow it up.

Prof. Skinner: This is a very interesting discussion, but we still have two numbers on our program, so now we will leave this discussion for the present. I may say in this connection that Prof. Wiancko will be glad to correspond with those who have questions to ask on this subject, and it will be discussed at the Farmers' Short Course next week. It is certainly a very interesting subject.

I now have the pleasure of introducing to you Mrs. Virginia C. Meredith, of Cambridge City, who will present the subject, "Livestock and the Homestead." I am sure she will interest this audience.

LIVESTOCK AND THE HOMESTEAD.

Mrs. Virginia C. Meredith, Cambridge City, Indiana.

It seems essential to get away from the farm if we would find the farm attractive. It is quite possible to stand so close to the grand cathedral that one cannot see its stately walls and lofty spires and so miss the spirit of uplift and adoration. There must be for other things beside the artist's picture a perspective, a setting, a relation of parts to the whole. The charm of livestock farming lies in the fact that it logically invites going away at intervals; and coming back stronger and happier.

That is a grand phase of livestock growing which relates it so forcefully to the proposition that we hold the soil in trust—not in fee simple. And who shall do justice to that other phase of livestock farming which considers its relation to the ethics and economics of farm labor, a large subject now looming large in national welfare? Many as are the fine sides of livestock farming it seems to me that none is worthier of our attention than its contribution of real home making. More than another type of farming it leads the farm family into sympathetic knowledge of other places and related things, and thereby is furnished a background, a sort of perspective, a best setting for the farm home. I would have many boys and girls go to the town with its burdens and duties, but I would have many men and women stay on the farm and have within their horizon a degree of joy that can be matched nowhere else. Just at this particular point in time we appreciate as never before the vital relation between livestock and the homestead. The soil and its use is thought of with intelligence never before accorded, and in consequence there emerges a clear perception of the truth, long understood by a few, that Nature has a long plan that conserves the fertility of her soil and that in this economic plan she employs her useful animals. Nature is a keen, a shrewd and a relentless manager. When man seeks to ruin her soil by one-crop farming she does it to him and does it first. As David Harum says—"the incompetent farmer is ruined himself before he ruins his acre." Ingalls says that grass is the forgiveness and the benediction of Nature. Where we find grass we find livestock and where we find livestock we find the heaviest yields of grain, the most fertile soils. Is there any relation between fertile soil and happy homes? Yes, the dollar is beautiful when it "answers the august appeals of life!" We grow more capable of enjoyment, more capable of service when we know more; know more of life, more of books, more of nature,

more of travel. Whatever broadens will also deepen life, and to get these good things that we call culture we must have some measure of money with which to pay the price, a part of the price, not all of it fortunately must be paid in money. Listen to Governor Oglesby's eulogy of corn: "Aye the corn, the royal corn within whose yellow hearts there is strength and health for all nations. The corn triumphant that with the aid of man hath made victorious processions across the tufted plain and laid foundation for the social excellence that is and is to be. This glorious plant transmuted by the alchemy of God sustains the warrior in battle, the poet in song and strengthens everywhere the thousand arms that work the purpose of life."

Social excellence and corn! Had you thought that corn meets its highest use with livestock, making the meat that "strengthens everywhere the thousand arms that work the purpose of life?" Corn is King, but is King only because improved livestock places the crown! Corn grows where the best pastures may be made. Blackmore in *Lorna Doone*, says of the downs that nature knew what the demand would be before she placed her best mutton there. Nature had mighty help from Bakewell and Ellman and Webb before the tidy Southdown was placed anywhere.

That improved livestock in the corn belt region requires improved pasturage is a proposition denied and ignored by too many—yet it rests on a basis as sound scientifically as the theory of protein and carbohydrate.

Many have sowed timothy and clover on wheat ground and called the result pasture, but it does not deserve to be dignified by the name of pasture. Is it not a crude practice to wait until "blue grass takes the meadow" as we say; is it not crude to permit nature to do the seeding with indifferent seed? When we shall put as much money and labor on our pasture as on our corn acre we shall have a great vision and be prepared to say something about the value of pasture.

What does all this mean? It means a clean and attractive farm, much of it in pasture with cattle and sheep and horses, the corn field as attractive as a garden and the whole a spacious doorway—a really fine setting for the homestead. In such a homestead on such a farm there is never a dull day, there is joy even in a partnership with the weather with all its eccentricity. Only those who live on farms know much about the charm of the weather's eccentricity. Those who live in town miss a fundamental joy in missing weather in the open.

The "poor consumer" is exciting the grimaces and jokes of

the writer of squibs. The "poor consumer" is the successor of the overworked figure of "the hay-seed"—the poor farmer! Is there any logic in the situation? Think you that the farmer who was the butt of cheap jokes because he had to rise early and work late; the butt of jokes because he had to wear old clothes for the want of new ones; the butt of ridicule because he had to bring up his children in ignorance and narrowness for the want of money to pay the bills of education and culture—think you this farmer is now drawing his back pay? Is there poetic justice in the poor consumer now paying the farmer for the time he has overworked in the past; paying him for the hardships and deprivations his family endured? Is there any poetic justice in the poor consumer having to do without a coat in order that the farmer, who in his time has gone scantily clad, may sell ten cent hogs and sixty cent corn? Any poetic justice in the poor consumer foregoing a pleasure excursion in order that the farmer may sell his products for enough to buy an automobile?

It is "the thoughts we are thinking" that color our life and give us joy. Pastures and livestock give to the homestead its best setting. "The crop is fundamental but it is not final." The family is final and the test of any method of farming is its influence upon the children in the homestead. Livestock brings us in touch with minds like those of Bakewell, Darwin; in touch with the history of the most fertile lands, Great Britain, France, the Channel Islands; in touch with the great exhibitions, the International, the State Fair; in touch with the best farmers and breeders in Associations and Institutes, in touch with the Agricultural College and Experiment Stations; in touch with the best farm homes; in touch with the best farm papers. With the lamented Herrick we exclaim—"How interesting farming has become!" Who shall measure the ministry of dumb animals, their influence in forming character by giving us patience, courage, victory in doing and the sense of mastery? Who shall say what it may mean when farmers generally cease to "gamble with one crop and the weather" and instead find compensations everywhere? Find the weather too wet for corn is just right for grass! The corn too soft for the elevator admirable for the cows! He lives below his opportunities who does not have a stock farm. The glory of outdoors, the use of outdoors is revealed to dwellers on the stock farm. 'Tis they who are easily beguiled to walk or ride over the pastures, to know the grandeur of the spreading tree; yes, to see the friendly stars as night journeys are made to flock and herd. There is much in knowing how to live on a farm; when to go away; when to have visitors and how to entertain them.

Prof. Skinner: I am sure I voice the sentiment of this audience when I say that we thoroughly appreciate this address of Mrs. Meredith. It seems to me that we sometimes forget some of the beauties of the farm in our pursuit of the practical things, and I believe it is time we are coming to look on the other side.

We will now have a more practical subject, and I am advised by Mr. Maish that he can cut his coat according to the time he has and that he will not keep us very late. Hon. D. F. Maish, of Frankfort, will talk to us on "The Utilization of the Corn Crop." I hope everyone will remain, for it is a very practical talk.

THE UTILIZATION OF THE CORN CROP.

Hon. D. F. Maish, Frankfort, Indiana.

Mr. Chairman, Ladies and Gentlemen: I assure you it is a real pleasure for me to be with you today and talk over some important things of the farm. I am certainly very much pleased that the subject that has been chosen is one that interests us all. I feel that perhaps no other topic could be selected that is so closely interwoven with livestock interests as the question of corn growing, and what we are going to do with the crop when we have it. I have been a grower of corn in Indiana for a number of years, and have been thinking of the importance of corn to our State, and I came to the conclusion that it is pretty nearly the "whole thing," and when you take into consideration also that the livestock industry is largely based upon our success as corn growers, I realized the force of that statement.

I feel that until of recent years we were living beneath our privileges so far as producing the required number of bushels of corn per acre, but we have been working along this line for several years, until we are able to show better results. We have had the corn fever so high that some people predicted we would have a relapse, but this has not happened, and the effort to improve the corn crop has resulted in the improvement of other things as well. Says Dr. Stone, "I do not think Indiana farmers could have chosen a subject to make a campaign upon that would reach more interests than that of growing corn." I remember the first work I did in attempting to carry out some of the things we were told, when I took a little seed box 30x21x2½ in., filled it with loose soil, then took it out to the seed house and planted the seed very carefully,—I not only thought about what I was doing, but I realized that I had under observation everything in connection with the corn crop for the coming year, the condition of the horses, implements and everything about the farm. And so I think this campaign for corn has resulted in better things not only in the corn kingdom, but all along the line.

Of course I fully realize there are some things we have not accomplished. Mrs. Meredith touched on that. People do not live as they ought. I agree that we ought to live a little better on the farms, and if that was done perhaps there would not be so much trouble about boys going away from the farm.

Now, while this work has been going on, we have new problems today. We hear a great deal in recent years on the question of conserving our natural resources, and naturally there is a

quickening all along the line on this matter of conserving the natural resources of the country, and as corn growers the question comes to us whether we have been conserving all that Nature has bestowed upon this great land. And so we come to the question of the "**utilization of the corn crop.**" I think it was Professor Henry who said, in speaking of the importance of the corn crop to the American farmer, that the most important work of the American farmer today is how to successfully grow and administer the corn plant." Not only successfully **grow**, but **administer** the corn,—how to use it and get a good profit out of it. And so we have this problem that people are beginning to look into. I desire to turn your attention to some things along the line of farming, as to whether we are conserving as we should.

The high cost of living is causing some inquiry at the present time as to whether or not the producer is at fault or the middleman, or who it is that is boosting the prices. I think they have already discovered, without going very far, that the farmer is not getting more than he deserves. Yet I say to you that I believe we have been wasteful. I want to call your attention for just a few minutes to the real condition in Indiana, where corn has been grown for over sixty years.

Ever since the new lands have been cultivated, we have been growing corn upon them, and we are doing today in a large measure what the pioneer fathers did,—husking the corn from the stalks and leaving the stalks in the field. The price of land has advanced in value, the price of food stuffs has gone up, but we have gone on leaving thousands of acres of corn stalks here in Indiana corn fields. I took some observation this afternoon as I came to this meeting. There are some cases where people have been utilizing the product in a more careful fashion, and are getting more out of it. But I counted as I came down from Kokomo this afternoon, forty-one fields that I could see from the car, and there were but four fields where the crop was all harvested and carefully put away. A part of these fields, a large number, thirty or more, were left with the stalks in the fields, so I came to the conclusion that we are wasteful. I remember back in the time of Governor Mount, he told about the corn stalk waste in Indiana, but we seem not to have found a way to prevent it. I do not know that we have **tried** to find a way to prevent it.

If we travel east, into Ohio or Pennsylvania, or into sections of our own State, we will find the successful farmers have found a way. In traveling over twenty miles of territory in Allen county three years ago, I never travelled over territory where I

saw more good barns and well equipped farm homes than in that twenty miles. I saw but one field of standing stalks. I made an observation from Fort Wayne to Portland and saw but one field of standing stalks. I imagine from the general condition of things in that section that the people have found a profitable way to care for corn products.

Now, what has been said about this question as to the value of corn stover? Prof. Armsby, of Pennsylvania State College, in his report of '87 says that about 37%, or a little more than one-third of the food value of the entire plant is found in the stalk or stover of corn. If that be true, what would that mean in Indiana? I think from one-third to one-half of the stover of the corn in Indiana is in the fields. If that be true, on a basis of one and a half tons per acre, we will have about three million tons in the corn fields today. I am talking about better utilization. I have studied some as to what that would mean to Indiana in an economic way. If there are three million tons in the fields today, there is an actual loss as between the food value and the fertility value, because when we harvest any crop we do not disturb the fertility value. Estimating the cost at \$3.00 per ton to put up the whole corn we have an actual loss of at least nine million dollars worth of food value in the corn stover in the Indiana corn fields today.

What would that do? It would pay the Governor's salary for eleven hundred and twenty-five years; it would build four State Houses like this one; it would build nine hundred school buildings at a cost of \$10,000 each, and we brag a good deal of our school buildings and our system of education. It would build ninety coliseums at a cost of \$100,000 each,—one for every County in the State. It would build three thousand miles of public highways, equal to a roadway three times around our State, at a cost of \$3,000 per mile,—and then have a little pocket change left. We could do all this if the scientific findings are true. Are they true? There have been some experiments made by practical farmers along this line. I was talking to a farmer as I came from my home last Monday morning, between Frankfort and Lebanon. He was telling me how he had tried this on twenty acres of corn land, and he sold his share of the shredded fodder at \$8 a ton; deducting the cost of baling this would leave him \$6 a ton clear, which is a fair valuation to put upon corn stover. Now, that is only one instance. Men have found that it is a satisfactory farm feed. In experiments that have been made it has been found that when stock cattle have been put upon a ration of timothy hay alone, and another lot on corn stover, there was only a slight variation or difference between the weight gained.

Considering the value of corn stover as a feed, why should we allow this great waste to continue? What would we think if the Chicago stock yards would announce that they were discarding all the hides and by-products? We would say that is not good business. If all the good corn land of this State was purchased by a syndicate to be operated as a business proposition, do you not think they would figure a little closer than we do? I believe they would. But I believe this waste is largely because it is customary. When we look at the high cost of foods, and what it costs to winter livestock in Indiana, can we allow this waste to continue?

I do not think I invited you to ask questions, but I am like the old man who said he could answer any question asked, no matter what it was. If he knew the answer, he would give it, and if not, he would just say he did not know.

Now, if it is true that we are not doing the best we can, what is the real solution of this question? I confess I do not believe we have arrived at the best way yet. I believe in harvesting our entire corn crop, and using the most improved machinery, but in doing this we are dependent upon one machine to cover too large an area, and we are trying to put the corn stover into the mow in a condition that we would not think of putting in any other forage crop on the farm. If we put it in in bad condition, it will come out in bad condition.

Now, what are the methods that are used? In talking about how best to utilize the corn crop I do not think it is necessary to discuss whether you should sell it for so much a bushel—you should use the crop on the farm in feeding live stock. I do not believe there is a man here but believes that is the best way to get the most out of the corn crop. A good many men are selling their corn crop from the farm, but they will all confess that some circumstance caused them to do it. So we will not waste any words on that discussion.

I think we all appreciate the value of feeding the roughage and corn as compared to selling it in the market. Then sell the finished product, not the raw material,—the finished product in the form of livestock or dairy products,—which is the most finished products we have today.

Not only are the farmers beginning to see that it pays to feed the products and keep the fertility on the farm, but great business interests are beginning to see it. Three years ago on a dairy train, one of the officials of the road who accompanied the train made this kind of a talk. He said: "You may have wondered that a great railway is interested in a business that gives it a

comparatively few pounds of freight. For a short run it would not pay us to encourage the dairy; but we are not built for a short run, we are built for a long run. We have found from our experience that if it were not for the farmers we would cease to haul out of the country in this agricultural region, and our earnings would be reduced to a point where perhaps it would not pay to operate this road. If you are doing a good dairy business you will have a profit from your land, and we will be shipping furniture and household goods and all the things that cannot be purchased in the country, and you will ship your products to the cities, and we will haul both ways."

I thought that was a great lesson. We know what J. J. Hill said about the value of keeping livestock on the farm. He called attention to the fact that it was not the manufacturers of the country that its prosperity depended upon, but the condition of the soil. Why did he say that? One reason was that out on the farms of Dakota and Montana and some of the other western States the yield had been reduced, and the railways of the country were the first to feel the loss. So he made his word good, and offered \$8,000 in prizes in Minnesota, and one of the requirements for entering was that a man should keep twenty head of cattle, twenty horses and twenty hogs on that farm. He knew what he was doing.

It is not worth while to spend time to discuss this, so let us direct our attention to the question of how we are going to utilize this corn crop. There are three or four methods we can employ without leaving the stalks in the field. I believe we ought to put a portion in the silo,—a much larger portion than we do today, because the results of experiments show that there is a higher profit, when we consider the number of acres, from fresh, well matured silage, than in the dry state. I would not advocate putting it all in the silo. I think we often make a mistake in continuing our animals on one ration. No man should expect to put livestock on one ration, month in and month out, and have them thrive. We can grow a variety of things on the farm, so we are not compelled to do that. There are so many varieties; almost as many as there are breakfast foods. We can provide a variety of food for our animals, and I believe it is our duty to do it.

I believe they should have some coarse fodder. A man said once in a farmers' institute, "It is a nice thing for cattle to play with on sunny days," but there are better ways than to have this coarse food lying around on the farm. I believe we ought to put perhaps one-third of it in the silo, then cut the remainder

and feed it either as coarse feed or shredded. I find many people separate it, even for beef cattle. I feed cows.

Now the question naturally comes up, why is it, if there is such a high value attached to this forage, that the Indiana farmers do not harvest it. Will it pay to harvest this corn stover? Now I have worked out a little problem to show you about what I have concluded. The Government has also made some investigation, and here is a bulletin which I would advise all corn growers to get. It is Bulletin 303. It gives the results of experiments in harvesting corn, experiments that have been made in trying to take care of the entire product, the cost of handling the product, and then a very nice summary, and we have some conclusions here that show the average of the cost of taking care of our corn crop in the form of shredded fodder. I think we ought to put at least one-third in the silo. Of course where a man is isolated and is short of help, he is at a disadvantage, but where there are three or four or half a dozen men in the community, they can put it in the silo nicely. I am going to give you some figures to show you why I think it has paid me, and you can see whether it will pay you to put it in the silo. We hauled the corn about one mile.

To hauling 200 tons of fodder:

7 teams, hauling	\$ 63.00
1 team, cutting	9.00
4 hands	21.00
1 feeder, three days	5.25
1 man in silo	5.25
14 meals for men, 3 days	8.40
Feed for 8 teams for 3 days	3.60
1½ tons of coal	5.25

Total for harvesting 200 tons of silage.....\$120.75

This is perhaps at the highest figures. If everything is favorable, everything close at hand, we could make a better showing. This gives us an average cost of 60c per ton to put it in the silo. Some of my neighbors said, "Do you think you will ever get \$500 or \$600 out of that?" I said, "I certainly do."

The value of silage as feed can be easily seen. Scientific findings show 12% or 15% more profit is received from silage for dairy cattle than any form we could put it in, because there is economy in harvesting it all at once. Then people should feed it all at once—corn and foliage and husks and stalks. We get the feed nearest summer conditions in winter. I know what it means to young growing stock and dairy cattle. Formerly it was thought

it was not good for beef, but a gentleman told me he often feeds silage up to the fattening period; it gives glossy coats. So I feel my silage is worth 10% or 15% more than the same amount of corn put up as dry feed, and yet I want dry feed too.

Now, as to the shredded fodder. There is where we nearly all fall down. We say we cannot afford to put it up, that we have tried it occasionally, and about half the fodder is put up in bad condition. The days are short, the weather is uncertain, and you are short of time, and you put in some fodder that is not at its best. Well, we put up our shredded fodder in about the same way as we did our silage, and here is what it cost us for 200 shocks, shredding and husking.

200 shocks at 8c	\$16.00
6 teams	18.00
4 men in field	6.00
2 teams hauling corn	6.00
1 man in mow	1.50
1 man caring for shelled corn	1.50
Meals for 8 men	3.65
Feed for teams	1.35
Fuel	1.75

Total 1 day's work\$55.70

We found that the 200 shocks cost us at the rate of \$6.48 per acre, the corn in the crib and the stover in the mow. If we deduct the cost of husking, counting the harvesting, and it gives two bushels to the shock, at \$1.44 per acre for husking this same corn, we have a cost of \$5.04 for shredding an acre. If we have an average of two tons per acre, we have a cost for harvesting of \$2.52 per ton. And I absolutely know if we did not harvest it we would not have it on the farm, but there you can grow a forage crop and grain crop on same land and harvest it for \$2.52 per ton. If that is worth \$6.00 on the market, we have a saving of \$3.48 per ton. Valuing the stalks at \$1.00 per acre in the field, and charging the cost of 8c per shock, we have a net gain of \$4.04 per acre for this operation of putting up shredded fodder. Is there anything wrong about this?

A Member: How do you cut the corn without shredding it?

Mr. Maish: We feed it in the form of crushed corn, and put in two parts bran and use it for our dry feed to dairy cows. The shredded fodder of course we feed as part of the roughage.

A Member: Would you crush the corn for beef cattle?

Mr. Maish: I think from my observation it would not pay.

Mr. Amos Druley: What is the use of doing all that work? Why not put it in the barn and then take your cutter and cut that feed, corn and all? Pick up all the waste and save all that extra expense for having this fodder shredded.

Mr. Maish: If we were feeding for beef alone that might be the best way. That would be better than to leave it in the field, certainly. That would be utilizing it in a very nice way. We use this for general stock on the farm—young stock and horses. We use shredded fodder for horses along with oats hay, and we use it for dairy cattle for the night meal.

Mr. Druley: Will they eat it and silage too?

Mr. Maish: Yes; we feed two feeds—the ground before milking and the fodder and silage after. We feed clover hay after the morning meal, oats at noon, and shredded fodder at night.

A Member: What kind of machinery should you use to put up the whole corn, dry corn, fodder and all at once, and how would you put it all in the barn?

A Member: At one of our farms we take in the fodder and cut it as we need it, cut it corn and all.

Mr. Maish: Do you depend upon getting it in from the field as you use it, or do you store it?

Member: At one farm we put it all in, but at the other farm we do not have the room.

Mr. Maish: The greatest difficulty is that in a great many instances we do not have room to store away coarse fodder and then use it in this way, but still we can pile it so that we will not be dependent upon weather conditions when we want to use it.

I think perhaps I have gone over this question at sufficient length. I certainly thank you for hearing me. I hope we will continue to work at this problem until we have solved this question of entire utilization, and when we have done that I think we have done our duty as corn growers and good agriculturists, and will not be subject to the criticism of people who are trying to find fault with what the farmer is doing.

Prof. Skinner: We will now have the report of the Committee on Resolutions:

Whereas, the work of Hon. W. R. Pleak in advancing the cause of agricultural education by promoting the work of this Association and aiding in the securing of State funds to enlarge the work of the School of Agriculture at Purdue University and the Experiment Station was of a high order and

Whereas, He has left the State for permanent residence, be it therefore

Resolved, That the thanks of the members of the Indiana Livestock Breeders' Association be extended to him and that their best wishes go to him in his new home.

Whereas, The efforts of the Indiana State Board of Agriculture in advancing the cause of agricultural education by elevating the ideals and standards of excellence of all farm products by conducting an exhibition that is second to none of like nature, and

Whereas, All funds appropriated by the State have been economically used and the results are fully appreciated by the people of the State, and

Whereas, Many improvements are badly needed on the State Fair Grounds, therefore

Be It Resolved, That the Indiana Livestock Breeders' Association respectfully urge the next General Assembly to make such provisions to meet these demands as may be possible.

Whereas, The services of Prof. J. H. Skinner in promoting the work of this Association are fully appreciated and

Whereas, By his request he has been relieved of the work of the secretaryship, therefore

Be It Resolved, That the thanks and good wishes of the members of the Indiana Livestock Breeders' Association be extended to him.

A. J. McDerald,
F. W. Van Natta,
T. A. Coleman.

Moved and carried that the resolutions be adopted.

Prof. Skinner: I would like to add to one resolution. Mr. Pleak has gone to another State, but I think it is quite fitting that we should make him an honorary member of this Association. I would make a motion that Mr. Pleak be made an honorary member of this Indiana Livestock Breeders' Association.

(Seconded and carried).

Prof. Skinner: I think this ends what I consider one of the best sessions we have ever held. The attendance has not been as large as it should be, but the program was excellent. The work is growing, and I certainly am very much gratified. I wish to thank the Association for its resolution in my behalf. We will now call the meeting adjourned.

THIRTY-FIFTH ANNUAL MEETING
—of the—
INDIANA WOOL GROWERS' ASSOCIATION

Indianapolis, Ind.,

January 5th, 1910

In the absence of the President, the meeting was called to order and presided over by the Vice-President, Mr. D. W. Lesh, of Markle.

Letters of greeting were read from Mr. Richard Gibson, of Canada, and Mr. George McKerrow, of Wisconsin.

Response—John L. Thompson, Gas City.

I know both of these gentlemen very well, and I know they have devoted their whole lives up to now to the sheep industry, and have done all they could to help it along. I believe it is a worthy effort. I think there is nothing better for a farmer today than the growing of sheep,—nothing more profitable, nothing better for his farm, and if I was asked to give advice to breeders or shepherds today I would advise them to continue in the business. It is the business above all others that we have to continue in to make it a success. Of course, it has its ups and downs. Sometimes very profitable, as it is now, and maybe within a few years very unprofitable. But my observation has been that it pays to stay with it continually. I do not think there is anything better for the land or the farmer than to grow sheep and wool, but at the present prices farmers are getting for their products I think a good many will be tempted to make the mistake of retiring. I think it is a great mistake for a farmer to move to town after he has accumulated enough of this world's goods to surround himself with the luxuries of life,—leaving all this and moving to town with the idea that he can be more comfortable. I think as a rule he will find he has blundered greatly. I do not believe in retiring at all in this world. I think it is better to just work on. I have in mind a couple of verses I would like to give you. They seem to fit this thought I have in mind:

“Let me live in a house by the side of the road,
Where the race of men go by—
The men who are good, and the men who are bad,
As good and as bad as I.

“I would not sit in the scorner’s seat,
Or hurl the cynic’s ban;
Let me live in the house by the side of the road,
And be a friend to man.”

Mr. Conger: I would just like to say that our friend, John Thompson, does not practice what he preaches. Now, I’ll leave that to anybody here. He advises farmers not to move to town, and yet he has left his farm and come to town. I would suggest the next time he gives advice to farmers he tell them to buy an automobile and go to town every day. But I have taken advice from Uncle John a good many times, and I expect to do it again. He never gave me any bad advice.

Mr. Thompson: I might say a word in regard to Mr. Conger’s criticism. I did build “at the side of the road,” clear out at the edge of town, and I take a great deal of pleasure in seeing the farmers go by. I wish my farm joined up pretty close to the town. But I was compelled by conditions that I could not control at all, to leave the farm and to go into other business. I still have my farm of three or four hundred acres, and I think a great deal of it, and if it were within driving distance of town I would certainly have stayed on it. But the other business I started got to be so big that it required all my attention, so I had to leave the farm.

Mr. Lesh: We will now have an address by Mr. John R. Nash, of Tipton.

Address—John R. Nash, Tipton.

Mr. Chairman: I have no address to make to the Wool Growers’ Association. A few days ago I was informed by the Program Committee that I would be expected to talk on “The Future of the Sheep Industry in Indiana,” but they added that I might select my subject if I wished. I thought I would touch on a few things that I might be able to talk about, and in order to make it as brief as possible I have written out what I have to say, and will read it to you.

FUTURE OF SHEEP INDUSTRY IN INDIANA.

John R. Nash, Tipton, Indiana.

With present high prices of both wool and mutton it appears as though the outlook should be very bright for the sheep industry anywhere they could be grown. With everything seeking a higher level in prices, our land and everything we produce thereon, labor and every manufactured article, it looks as though these prices would be maintained and even go higher.

A few months ago every sheep man was worrying for fear the tariff on wool would be taken off, and with a large per cent. of Congress and the President of the United States favoring a reduction, their fears were well grounded. But there were enough friends of the American sheep industry in Congress to maintain the old schedule, and since sheep men have been assured of this we have witnessed one of the greatest revivals that has ever been seen in the business. There has always been a feeling that the man with the small flock on the small farm could not compete with the large ranchman with his free grazing land and thousands of sheep. But you all understand that the conditions with the ranchman are rapidly changing. The large ranches are being cut up into farms, the free grazing land is being taken up and the man with his thousands of ewes is fast passing out of existence. We are going to have to look to some other source for our supply of wool and mutton, the demand for which is fast increasing.

There is nowhere to turn except to the small farmer with the small farm, and why should he not produce this supply. There are larger profits from a small flock of sheep well managed than from anything else in the farm.

As you drive through the country just observe the farms on which a small flock of sheep are kept and note the difference. There is an evidence of thrift and neatness, progress, prosperity and comfort that you don't see about the man's place who feeds race horses, stands a stud horse or runs a threshing machine. There is something about contact with a flock of good sheep that elevates a man morally and mentally as well as financially. The trouble with most farmers that have tried the sheep business and quit it is that they have gone in on a speculative basis. They see the price of wool up around thirty cents, lambs selling at \$6.00 or \$7.00 per hundred and their neighbor making money off his sheep, and decide they want a flock. He invariably buys

them high, as there are none for sale at such times except at a very high price, turns them out with his other stock, expects them to winter in a mud lot around a straw stack with cows, horses and hogs, and the result is a disappointment and a flock of sheep for sale the next year at whatever price he can get.

Now how are we going to get away from this method that invariably proves disastrous? You must start with the young man who is just starting to farm for himself. He doesn't go in from a speculative standpoint. He is looking for something that will yield him a fair income, and is willing to give it the best of his care and thought. He is willing and trying to learn, for he feels that his success or failure in any branch he undertakes means his success or failure in life. The older man knows about what his power and abilities are for success or failure and hence is not the willing student the younger man is. I think this point cannot be made too strong. It's the younger man who starts with a willingness to learn, who succeeds in the sheep business.

Now, as I am not limited to any particular subject would like to say a word on the management of a small flock of sheep. There has been enough said already as to what breed and how many. One plan I shall mention that is almost invariably successful, especially where large bunches are kept, and that is to go to the market and buy a good grade of western ewes, raise one set of lambs from them, then turn the whole bunch on market and bring back another bunch of thin ewes. To succeed well by this plan the ewes must be extra well cared for and go back to market in good condition, and they will bring considerably more than first cost. This plan appeals strongly to me for two reasons. First, the ewes are seldom affected with worms, and by changing every year you stand some chance of keeping free from them. Then there are always some ewes in a flock that become too fat for profitable breeders, that is, they can be replaced by ewes that are sure breeders for much less money than they will bring. We have followed this plan to some extent ourselves, and always with gratifying results. I would recommend this plan to the man of speculative turn of mind, and one that does not care much about how his flock looks. But to the careful man who takes a pride in producing something good, who likes to take his friends out and show them his good colt, his big calf or his fine lambs, I would say to him: Keep some distinct breed and breed and rear his own ewe flock. Then when he determines whether he wants to breed for wool or

mutton select the breed that suits him, and in selecting the breed consult no one but himself. Then, in selecting his individuals, place constitution and vitality above everything else. Your ewes must have good broad chest, good thick heart girth and plenty of room for her digestive organs. I care not how fine a head she may have; how well she is wooled to her nose and her toes; how well she may be named down, she is of little value without a good, deep, thick barrel. I would never buy a ewe for a breeder that was tucked up in the flank, no difference how good she might be otherwise.

A few years ago it was unheard of to pay \$25 for a ram, but now it is a common thing for breeders that keep a flock of over twenty or thirty ewes, to pay \$50 for a ram. The only thing they want is a good ram. In this age of the world it does not make much difference what price you have to pay, if the thing is what you want. But \$40 or \$50 is not too much to pay for a good ram, for in a life time that ram should get two hundred lambs, and that is cheaper than a common ram, even if it were given to you.

There is another little point, and that is getting the ewes to own lambs. Perhaps you all know this and have tried it, but it is little trouble and is absolutely sure and certain. Where a ewe loses a lamb and you want her to take another, just take the skin of her own dead lamb and sew it on the back of the lamb you want her to take, and put it in with the ewe. That is all you have to do. The lamb will soon be like her own, and it will know no other mother than the one you put it to.

I would like to hear some discussion of this subject, especially the stomach worm proposition.

Prof. W. C. Coffey: There is another way, just to slit the skin on the inside of the legs above the knee, then cut the skin around the leg below the knee, and work the bone out backwards, and then slip this skin on the lamb by putting his legs through it. You do not need any twine and needle. I leave this on four or five days. That is plenty long enough.

Mr. Thompson: Why does that cause the ewe to own the lamb?

Mr. Nash: The same scent as her own lamb. She recognizes her lamb by the scent. She does not recognize the bleat of the lamb. The lamb will recognize her bleat, but the ewe does not recognize that of the lamb.

Prof. Coffey: After a lamb is a month or two old, do you think the ewe learns to know it by sight or voice?

Mr. Nash: I hardly know about that.

Mr. E. R. Smith (Indianapolis): I would like to ask whether the matter of drinking water has been thoroughly tested in this matter of worms? Our one year's experience proves that this has produced better results than anything else we have looked after. In fact, when we have only running water and put out some black salt, the worm disappears.

Prof. Coffey: I do not wish to say much on this subject, as it is part of my discussion to-morrow morning. Mr. Nash has given part of my speech, but I am glad he touched on the subject.

Experience with stomach worms does not show that water is the only medium of infection. It may be that after all we have not very much proof along that line. Mr. Ransom, of the Agricultural Department, studied this little pest for two years. He learned some things, but he did not trace out the whole life cycle. He learned that the eggs are voided in the dung, and that in warm weather they hatch out in swarms in a remarkably short time. These eggs are laid in a state of infection, and by the time they are voided from the animal, and if the weather is warm, they hatch out in a very short time. If there is a good deal of surface water, you can see how they get washed into the grass. Then these little worms begin to crawl up the grass blades. It is by getting up on the grass blades that they are taken into the animal. In seasons like the last we have a good deal of this trouble. These worms hatch out and get up on the grass blades, and the sheep take them in with the grass.

I am inclined to think that we charge more against the stomach worm than we should. He is bad enough; he is our worst enemy; and whenever you find nodular disease and stomach worm working in conjunction, it will kill an old sheep. But there may be some other parasite working in the animal at the same time.

Mr. Smith: Is it not true that infected lambs do not travel over the pasture much, so that by keeping the barns clean and worked up we can avoid this trouble?

Prof. Coffey: I think that is very good, but I think you will find infected sheep running over the pasture. It is true that around a building there is more grazing done than any place else, so more eggs would be dropped there, and therefore it does pay to keep the buildings as clean as possible.

Mr. Lesh: The next number on the program is an address by Prof. W. C. Coffey, of the University of Illinois.

OBSERVATIONS TAKEN FROM THE PURE BRED FLOCKS
OF GREAT BRITAIN.

Prof. W. C. Coffey, University of Illinois.

All of us who handle or have handled pure bred sheep have been told of the superior flocks kept in Great Britain, and we have been satisfied that this statement is true because we have seen the excellent specimens imported from that country year after year for show purposes at our large exhibitions. Because these animals made it almost impossible for our own sheep to win in the open classes we are all curious to know what combination of circumstances has put the British breeder so far ahead of us.

Last summer while visiting these pure bred flocks in various parts of England and Scotland, one of the questions I often put, especially if the history of the breed was in doubt, was, "How was your breed made?" Many times the answer to the query was, "This breed is descended from sheep peculiar to this district from a very early time." Some went so far as to say that the early progenitors of the breed in question were native to the hills it now occupies and probably always existed there. Another question I often asked was, "Has your breed showed marked improvement in recent years?" Some answered in the affirmative; others that they could not safely say their breed is any better than it was forty or fifty years ago. Such remarks led me to feel, in a more emphatic way than ever before, that the sheep industry of England is old—older than we are likely to think, although its exact age were indicated by dates, because it is difficult in this new country of ours to comprehend what a long period of development really is.

As you ride through England and Scotland and view continuous pastures dotted with sheep you are also made to feel that the sheep industry has held an importance commensurate with the development it has attained. One is so impressed with this importance that he is impelled to review the conditions that led England to develop her sheep industry.

In the middle ages England was the leading wool-producing country in the North of Europe. Spain was also prominent in wool growing, but England had the advantage over her in two or three ways. Spain produced practically nothing but fine wool from Merino sheep which could not be used alone for every kind of fabric, while England because she had so many breeds could furnish various types of wool suitable for blending to make fab-

ries of different kinds. Then, too, it is more difficult to transport wool from Spain to Flanders, the seat of the manufactures of that article, than it was to send it across the narrow German Ocean where swarms of light craft plied constantly between Flanders and the eastern coast of England. Still another advantage enjoyed by England was her comparative state of peace while western Europe between the 13th and 17th centuries was so overrun by wars that extensive sheep husbandry was an impossibility. In England, on the other hand, especially after the 12th century, nearly everyone in the realm was interested in agriculture and therefore in maintaining peace. After the Plague of 1348 even the great landlords gave up the cultivation of their arable lands and undertook sheep farming. Export trade in wool became more and more important, and there was a continual demand for English wool to supply the looms of the great manufacturing towns in Flanders and Holland. We see then, that from a very early time sheep occupied a prominent place in English Agriculture. As already noted there were a great number of breeds, and there was a continual effort to improve them. The fleece, however, was light, averaging only about two pounds and the animal was small. The attempts of breeders to improve their breeds were checked by the hardships of the mediaeval winter, and by the prevalence of disease, especially, foot rot and scabies. It has been estimated that the loss on flocks was 20% a year. They were generally kept under cover from November to April, and fed on coarse hay, wheat and oat straw, or pea and vetch stems, but no winter roots were available. The successful keeping of sheep through the winter was not fully solved until the coming of the Flemish and Dutch refugees during the reign of Elizabeth. These people introduced the cultivation of roots, clovers and grasses and as a result, in the 18th century it is said the weight of fleece had increased quite four times over what it was in the 14th century.

So, there was a time when England's sheep did not appeal, or rather would not have appealed to our notions of perfection of form and finish. Perhaps it was due to the urgent call for wool that kept her encouraged to grow sheep under the adverse conditions prevailing before the coming of the Flemish and Dutch and the crops they introduced. These adverse conditions did perhaps work a benefit to the future of the industry by weeding out the weaker individuals and by placing a type of sheep in each community best adapted to its conditions. We commonly speak of Robert Bakewell as the first great improver of live stock, and

so he was, and let us be too loyal to his memory to say anything that would reduce the estimate of his greatness, but we should also remember the Flemish and the Dutch who were responsible for giving England fields of grasses, clover, and roots, without which the work of Bakewell and of all other great livestock improvers in Great Britain would not have been impossible.

We have already mentioned that perhaps England's long struggle in keeping sheep under adverse conditions due to not having learned what crops to grow for them, proved beneficial to the future of the industry because each community took to the type of sheep best suited to its conditions. Whether this be the true explanation or not we see this trait of certain communities favoring one particular breed well developed. And these communities sincerely believe that no other breed than the one which predominates would prove as profitable. This belief is so deep seated that the casual observer does not feel inclined to dispute its validity and he feels that there must have been experience sometime to justify these breeders in their convictions. If you will permit the expression, these convictions have the one great virtue of causing the breeder "to stick to his own," a characteristic for which the British sheep breeder is universally noted. No matter how popular another breed may be, he calmly awaits for the wave of prosperity which he is sure must come to his breed. He sees great things in it—and so he thinks others will in time. More than that he feels it would be almost futile to grow another breed because his conditions would never develop it to a competing level with the neighborhood where the breed predominates. There is nothing for him to do but to stick to his own, and this he does calmly, but persistently, working improvement in his flock to the best of his ability. As a rule the son takes up the work of his father. With his father's work as his precedent, he continues to build by improving here and weeding out there and by any other means at his command. F. N. Webb is honoring the memory of his grandfather, Jonas Webb, by emulating his work in breeding the great Babraham Southdowns. Alfred Tanner is breeding Shropshires on the very ground where his uncles, the Cranes, bred some of the first specimens of the breed ever seen at the Royal Agricultural Society's show. Matthew Williams, a veteran Shropshire breeder of high standing told me of a ram which his father used that had the peculiar marking of a white ring just above the hoof on one of his fore legs. "And," continued Mr. Williams, "that peculiar marking disappeared from my flock only five or six years ago."

Implicit faith in the breed handled, a succession, and a long one, in the control of the different flocks, and communities making a specialty of a certain breed; are these not good causes of success? How often we lament the lack of such circumstances in our own country. We often blame the boy for not succeeding his father. Should we? I feel we should blame him only in those cases where he fails to better himself by taking up another pursuit. Our country is young; opportunities are great, and the boy who sees brighter prospects in something else than the sheep breeding his father is engaged in is not wholly to be blamed. Implicit faith in the breed handled, we should have, and that faith should be backed by tested reasons. Although our country is young, it is old in comparison to the age of the industry of mutton production. We have not yet definitely arrived at a conclusion as to the types of sheep best suited to our various communities. This is a matter of study which every breeder should inquire into closely and breeders should not be over-zealous in placing their breed under conditions not suited to it. For example, open folding drove the long open wooled breeds out of our corn belt. These are grand breeds, useful in their place and probably in the corn belt too, but the conditions must be right. Take as another illustration the Hampshire, a grand breed in his native home, and one rapidly gaining prominence in our own country. He is produced on some of the poorest land in England. But if you presume that he feeds chiefly on scenery, you are far wrong. And were I breeding Hampshires with every sale I would issue a certificate of transfer containing an injunction "feed well and with abundance, otherwise failure is guaranteed." In other words, it is suicidal to place a strong feeding breed under conditions where the supply of feed is scanty, and the supporters of the breed will gain ground and disseminate that implicit faith we hope for by avoiding it. As we make close study of the breeds best suited to certain conditions we are likely to establish certain breeds in particular communities as the English have done. This will undoubtedly be to our advantage and will bring us a step nearer to the perfection in sheep breeding they have attained because communities of breeders consciously or unconsciously cooperate in the cause in which they have a common interest.

Last summer, it was my privilege to attend the great Hampshire sheep fair, which is held annually at Salisbury, England. This fair is primarily a Hampshire sheep sale although the showing is one interesting feature of it. There were over 23,000 pure bred Hampshires at that show, and with the exception of a few

specially fitted sheep, all were walked into Salisbury on the morning of the fair. The breeders, the farm managers, the shepherds, and the buyers were all there. They talked—sometimes they agreed—sometimes they did not. They demonstrated their ideas with the animals in the pens. They exchanged ideas as we do when we visit together at the shows. But there it was much more advantageous because the whole business was close at hand, and the success of one and the failure of another were examples of home conditions. Surely the experience such a day brings to the breeder, puts him far ahead of the man who works alone in his community, and gets his inspiration in a second hand way by reading the journals or visiting exhibitions where only a few highly fitted animals are to be seen. If the time ever comes when we have communities of breeders generally—we have a few now—I shall not be surprised if our boys take up the work where the fathers leave off. It will mean something then to have a standing as a breeder in the community, and the boy cannot afford to lose the ground his father has gained for him.

The average English breeder has another contact which is of importance in making him practical and efficient as a breeder. He usually has sheep to offer on the open market. These are mainly wethers which as rams were for one reason or another unfit for breeding purposes. He prepares these sheep for the market the same as a commercial feeder in this country would feed them. He takes interest in getting as much out of them as possible and often his profits on them are not far behind what he realizes on the animals sold for breeding purposes. The result of this sort of handling is that it keeps the breeder in the realm of the practical—he does not wander off toward little foibles and fancies (except as he is tempted by foreign buyers) and he stays close to the idea that he is growing sheep for the mutton and wool they produce.

It was fortunate for the future of England's sheep industry that the demand for her wools remained so strong long after the introduction of such crops as the grasses, clover, and roots. This demand was so strong that it rendered an over production of sheep impossible. When conditions were adverse, skill at sheep handling undoubtedly received encouragement, which in no wise discontinued after they became favorable. Thus there arose a race of shepherds who are as famous as the animals they handle. We often hear that he is the best paid laborer on the English farms which fully indicates the estimate placed upon his importance.

We often say we have no such shepherds as England has.

Perhaps this is true but we do not give our shepherds the opportunities their brethren in England have, and hence the criticism is not altogether just. We equip him with as good barns, often better, but we are not so liberal with the variety and amount of feed we furnish the sheep he handles. Possibly our conditions will not permit us to secure as much variety of feed as the average English flock receives, but undoubtedly we would produce much better sheep if we were to study this question more closely with a view to giving as much variety as we can. On the English farms you will find the grasses, clover, vetches, rape, kale, beans, kohl rabbi, turnips, mangolds planted out so that the flocks have a fresh bite and something succulent every season in the year. The average pure bred breeder in our country relies upon clover, blue grass, timothy and sometimes rape. We feel well fixed if we have bright clover hay for the winter season, and necessarily we check and perhaps limit the growth of our animals. How can we hope to match England as long as the contrast in the food supply remains as striking as it is now? Will it always be impossible for us to do no better? Remember that England herself was once open to criticism the same as we are. It is doubtful if the English shepherd, as a rule, makes the most economic use of the feeds he uses; it is also a question in my mind if he does not often feed more than the animal should receive, but he has the variety and the quantity and he secures results.

We often see imported sheep that are called field sheep, but it does not necessarily argue that because they are field sheep they do not receive better care than ordinary forage. The English flock-master is careful to not allow the sheep he offers for sale to be in unrepresentable condition. The rams intended for foreign trade are placed in condition early so they are ready for the inspection of foreign buyers in June. Those intended for the August sales are fed so they will show bloom at that time. We need to exercise more care along this line. I recall being in Greensburg, this state, waiting for a train when I saw two yearling rams in crates setting on trucks waiting to be transferred to a train. On the crates were the cards of the breeder, secretary of one of the sheep breeder's associations. These rams looked as though they were well bred, but they were very thin in flesh and on that account a positive discredit to the breeder. It is true a prospective breeding ram should not be over fat, neither should he be—what shall I say?—under thin. I argue that a mutton ram should carry enough flesh to demonstrate that he has mutton properties.

We are not on the same level with English breeders in the selection of our breeding animals. He will pay a price for a sire and he will refuse to sell the ewes he has reserved for breeding purposes. Perhaps it is hardly necessary to discuss these topics—we have heard of them frequently. We often pay the price for sires and in this the English breeder is not so strikingly ahead of us, but we have never learned to hold on to the right females as he has. You cannot buy the reserve yearling ewes in many flocks at any price, and in scarcely any of them at a reasonable price. Their argument of course is sound for they hold that if the best are sold the breeder cannot long maintain that he has the best. And the selection of these reserve ewes is conducted on sane and safe lines. When the breeder shows you his reserve ewes he often remarks that he can hardly tell you why certain individuals have been reserved as their make up is not so pleasing as some that are offered for sale. He explains himself by saying that he knows the line from which these less attractive ewes have come and that they are to be depended upon. They have learned the valuable lesson that parents do not reproduce themselves except in a most general way, and that a knowledge of the line from which the animal comes is of importance in the selection of breeding stock.

One of the reasons why we do not hold on to the right females is because we do not keep careful record of the flock. I do not mean carefulness with respect to registration in the books of the association, but I refer to that detailed knowledge which takes account of the various things which renders the animal profitable or unprofitable. In many of the flocks I visited I noted great care on the part of the breeders to follow the animals in their career of producing. In one case the breeder showed me a carefully kept set of books, which gave an account of the record of each ewe in the flock and a detailed description of each sire used. These are valuable suggestions for us.

Then again the Englishman, as a breeder, outstrips us in the careful mating of his animals. He does not attempt to mate all his ewes with the same ram, and he tries to select those rams which will suit the different types of ewes in his flock. This is a matter of painstaking work for them. Mr. Thomas A. Buttar, one of the foremost Shropshire breeders, stated that he spent at least three full days each year in selecting the matings for his stock rams. We, on the other hand, often select a ram for our whole ewe flock without much thought of the especial needs of that flock. If we select a good ram, we could have done worse,

but had we made a careful study of the ewes, we could likely have done better.

Undoubtedly England has a better climate for sheep growing than we. We must acknowledge her superior natural advantages, but at the same time let us see ourselves as we are. Let us resolve to adopt better methods of feeding, more careful selection and mating of our animals, more spirit in developing breed communities, and community cooperation. Let us, as breeders of pure bred sheep be in the van of improvement that will bring a better sheep husbandry to our corn belt where at the present time there is great need, indeed, for improvement in our commercial flocks.

Election of Officers.

Election of officers resulted as follows:

President, John R. Nash, Tipton.

Vice-President, D. W. Lesh, Markle.

Secretary-Treasurer, C. A. Kurtze, Indianapolis.

Director from Wool Growers' Ass'n for Livestock Ass'n, Edward R. Smith, Indianapolis.

Adjournment.

Thirty-Fourth Annual Meeting

—of the—

INDIANA SWINE BREEDERS ASSOCIATION

Tuesday and Wednesday, January 4-5, 1910

Room 12, State House, Indianapolis

Tuesday Evening, January 4, 1910.

Meeting called to order by the President, Mr. T. A. Coleman (Rushville), the first number on the program being the President's Address.

President's Address

In coming before you men of the Indiana Swine Breeders' Association I feel that an apology is due from me. I wish to state, however, that I am not here because of any merit. In fact, I hardly know why I am here, but in thinking over the matter the past year I think I have arrived at the right conclusion as to why I was elected. I came in late to the meeting last year in this room. They were just taking a recess for election of officers, and I remember that a man who I had always considered a friend of mine—Mr. May, came around and introduced another man to me, and turning away he said, "I guess he'll do." They went on with their conversation, and in about two minutes my name was announced as President of this Association for this year. So I wondered why a man who I had always supposed was my friend would serve me that way, and I have decided it was because in my early life as a breeder of pure bred hogs I once spent some money with my friend May for a sow, and in two or three weeks she died, and I believe he thought here was a chance to sort of square himself.

In calling this meeting of the Indiana Swine Breeders in their annual session, there are a number of things that we are confronted with. In the first place we are confronted with the fact that we are engaged in a very profitable business at this time. It is not a matter of speculation, but a matter of fact, that the profits that may be derived from the handling of hogs, in whatever line you

may select, are very handsome. But I believe it is the duty, and the pleasure also, of this meeting to devise means whereby we can help some of the men who are feeding hogs at the present time and are not making as much out of them as they should. While with hogs at \$8.60 and \$7.50 per hundred there is no chance for lack of profit, I believe you will agree with me that there are some men feeding their hogs in such a way that they are not getting the right profit in dollars and cents. They are feeding too much corn. In fact, a great many hogs never see any feed except corn, in winter. They feed grass in the summer time, because the pasture is abundant. But it is no credit to the man handling hogs to handle them in that way. That is a part of the duty of the Indiana Swine Breeders' Association.

Our chief regret is that the men who are indifferent to this Association are the ones who really need the benefits of these meetings. Of course we have men engaged in the handling of pure bred stuff who are students of their business, and I want to emphasize that point at this place, that while we speak of a business life, it is generally supposed that we mean something else aside from farming, and I want to call your attention to the fact that with the rapidly increasing population that is occupying all the agricultural lands of this country, and with the increasing population in the great cities, the man who is engaged in producing supplies for this population must be a business man from the very start. We must bend our energies to studying the business, if we hope to be able to produce enough for this vast and increasing population.

It is a very vital question. Practically all of the corn land is occupied, and while we can grow more hogs than we do, it is a fact that we must feed the people from the lands that are now being farmed. We must so handle these acres and use the product that it will increase as does this population, and that is the problem that is before the swine breeders of Indiana, to so handle their lands and so increase their herds as to meet this very important and crying need.

Without any further remarks on my part, I will introduce the next speaker of the evening, Rev. I. B. Morgan, of Flora, who will address you on "The Fundamentals of Success." (Applause).

THE FUNDAMENTALS OF SUCCESS.

Rev. I. B. Morgan, Flora, Ind.

Mr. President: I confess that this is rather a new business to me, and I think your president wrote a real nice letter and picked out a real good subject, and then sent it to about the poorest man that he could have sent it to in the State. I think when he picked out a subject like "The Fundamentals of Success" he should have sent it to a man who has made more of a success of swine breeding than I have done. I am sure I thank you for the privilege of speaking tonight, and I hope that I can say something that is pertinent. You know sometimes we learn by hearing the contrary side. But after all, it is not to be expected that a preacher would know too much about the hog breeding business, or too much about succeeding in this line.

I notice we have a great program today and tomorrow. I notice the Governor was speaking this afternoon, and you have been having so many good things, and listening to so much, that perhaps it will be all right for an ordinary man to come in and rest your minds. I may be able to do that.

The first proposition that I want to talk to you about tonight, the first, fundamental principle or essential to the success of the breeder is honesty. You notice that I am not to speak to you of the particulars of the business, but the fundamentals, the foundation principles. If a young man is to go into this business and make a success of it, before he selects the hog he must select the man. The man is first, and he can fail with any kind of a hog, or he can succeed with any kind of a hog. I mean with any breed of hog. He can fail anywhere—Indiana or any other State, and he can succeed anywhere,—in the hog and corn belt. And so I say the first fundamental thing is to have the man, and we need first of all an honest man. Diogenes of old went up and down through the streets of his city asking for a man, and he would stand on the street corner and call for a man—a man. And when people came running to him he would say, "Away with you! I want a man, not a pigmy." Diogenes went over to Plato's school to find out the meaning of the word, and Plato said a man was a two-legged animal, so Diogenes borrowed a rooster and threw it over into the school-yard and said that was one of Plato's men. I think we have a different idea of a man from that today.

We want honest men, and, fellow-breeders, when I look into your faces I am sure you will agree with me that no man will

get very high in the breeding business that is not honest. The shyster, the man you cannot believe and cannot trust, may make some money, if that is the whole idea of success, but he never will be a successful breeder, and never will, in my judgment, advance the interests of the breed that he represents.

Honesty! How many men do you know who have gone out and tried by doing this and that to succeed in the breeding business, little things that were not straight? They have fallen by the wayside one after another. I will ask you a second question. How many men have you known that were honest and true and willing to do the right thing—how many of them have actually succeeded in their chosen line of work or profession? If I was going to advise a young man starting in this work, one of the first things I would say to that man would be that he must be honest,—be able to write a pedigree and mean it. Be true. Of course that is not everything, but that is one of the things.

The second thing is that if we are to succeed in the breeding business we ought to have an aptitude for the work. As Mr. Manlove said to me this evening, the successful breeder must like his business. You have all had people come to your farm and ask this and that, and then say, "I believe I will start in the business." I remember after I had been in the business three or four years, one morning a brother preacher came out to the farm. He was a starchy fellow, very polite, one of the kind who wear gloves and white ties; he could ring a door-bell in a polite way and tip his hat just so. I was out with the slop pail; I had on an old pair of overalls and was tramping around in the mud. He watched me for a while, then he said, "Really, do you like to do that?" Now, you know no man likes to hustle around with the slop pail. Well, he watched me a while longer, and then he said, "Mr. Morgan, I would just like to ask you, is there any money in it?" As though I was seventeen times a fool, working at that kind of work if there was no money in it. But I do think a man ought to do some thinking before he goes into this business—or any other, for that matter. I am not here to tell you how it happened that I got into the breeding business, or anything of that kind. But I do have a natural liking for a good hog, and I like to see it grow and do well.

Some of you may have heard the story of the man who wanted to find out what his boy was going to be, so he gave him a dollar, an apple and the Bible. He said, "Now I will leave him alone, and when I come back if he has taken the apple, I will make a farmer out of him; if the dollar, a banker, and if he takes the

Bible, a preacher." So he left the room, and when he came back the boy was sitting on the Bible, eating the apple, and had the dollar in his pocket. So he said, "I'll make a politician out of him." (Laughter). Of course, he would not have made a successful breeder.

But in picking a young man for successful work in breeding livestock, I would surely want a young man who had a natural aptitude for that kind of work. A young man with enough brain and enough brawn, with good old-fashioned common sense, mother wit, horse sense, so that when he goes into the work he will stick to it. A fellow that has some judgment. And the fellow that thinks that any sort of a young, half-witted fellow can go into the breeding business and make a success of it, is the greatest kind of a fool I can think of. He must know something; he must know men, and he must know what he wants to do. He must understand character.

Then there is another thing. I do not think any man ought to be ashamed of his business. The successful breeder should be anxious to let the people know wherever he goes that he is trying to produce something above the ordinary, and that fellow will be a help and a blessing to the community wherever he goes. No man should be ashamed of the way he earns his bread, if that way is honorable and true.

This is an age of specialists, an age when men make a specialty along particular lines, and we are compelled to do that if we make a success in the breeding business.

Now, I am not sure that I ought to say this, possibly not, but still, I am not afraid of this crowd. And the thing I want to say is that from just a little experience, I believe if I were called upon to advise a young man I would tell him to keep clear of "hot air" propositions. I believe I would advise him to do this. I do not believe a young man can make a success by paying fictitious prices, ridiculous, unreasonable prices, and still maintain his integrity and still maintain the respect and confidence of the community. I heard a hot-air breeder get up—he lives a good many miles from here—and say, "I am known as the biggest liar and rascal in our County." And I found out when I went over into his county that it was true, that his own neighbors said he was a rascal and a liar. Did he get rich? Well, I believe he did; I rather think he is a rich man. But I know he broke up one man, and I know men in a half dozen states that are hundreds and hundreds of dollars worse off than they were before they knew him. And I know there are lots of men and women that will go down to

their graves feeling that they have been robbed and mistreated by this fellow. I know men who have put their all into a scheme he was financing, and they lost it. I don't know how you feel about it, but when I cannot be as honorable in the hog breeding business as I am in preaching, I am through with it. I never want to be in any line of business that I cannot meet my fellows and look them in the face and have them say, "I am glad to see you, and I'll be glad to do business with you again."

Not so very many months ago I went to a certain man's sale, and when it was over he was about as disgusted a looking chap as I have ever seen. He said, "I can't understand why I have not made a success." I took him by the hand and sat down beside him. I said, "My friend, where are the men you bought of, the men you paid fancy prices to? Where are they today? Were they here?" He said no, they were not. Then I said, "They gave you to understand that if you paid those prices they would stand by you?" "Yes." "And did they do it?" "No." Then I said, "Next time you buy a hog, you buy a hog that will make you money; buy something that you know will do the man good when you sell it, and will do everybody good that deals with him. Try that." He said, "Morgan, that is just what was the trouble here today. I had a lot of stuff that the farmers did not want, and my neighbors did not want; but somehow I thought these breeders would come here and pay me the prices I had paid." Now, there was a fellow who had listened to too many "hot air" propositions.

There is another thing. You cannot change the people, so you had better give them what they want. You cannot change the people. If the people want a little, 110-pound Poland China, let them have it; and if they want a large, well-developed, easy grown kind, just as well give them that. What would you think of a shoemaker who would make all his good leather up into shoes of the kind your grandfather wore, and fill his whole shop with them? A fellow would come along and say, "This is good leather, all right, but I do not wear shoes of that kind." I do not care how good the leather is, people are going to wear shoes of the style they want, and they will not buy those shoes. Is that not right? As I see it, it is. How about that boarding house that would undertake to serve meals cooked up in the way they cook in Mexico? I am not objecting to Mexican cooking; it may be all right for Mexicans, but for a man in Indianapolis to try to serve that kind of meals, would mean failure as a restaurant man every time. Do you know every time I go among some of the

breeders, I find out when I look over their product that they are behind the times, and people do not want the kind of stuff they have, and they have said they do not want it, in the Swine Breeders' Journal and other papers. It is not what they want, and they will change breeds before they will buy that kind, and yet that fellow keeps on turning out the same old pair of shoes and the same old kind of food, and he says it's good stuff and you have to take it. Give people what they want and in the style they want it. If all the farmers in Indiana wanted hogs that had feet on them like a nice little donkey, I would go to work and get some hogs that had donkey feet on them, and I would have better donkey-footed hogs than anybody else. You cannot change the people. So you may as well give them what they want. If they want a large, easy growing hog, that is the kind they want, no matter what breed. I tell you, you must get in line with what people want, for you cannot change the people.

Another thing—be master of the situation. There are lots of things we do not like to do, but be master of the situation, be the best man. It is not the fact that the breeder has to compete with the pennyroyal flocks that are raised on the farms that bothers him. I will leave it to any breeder,—if you have the right kind of stuff the people will buy it and pay you good prices, and they will take care of it, and do more advertising with it than if you had given them a bargain. Some men go everywhere and get the best stuff, and then give it away. I was somewhat surprised at a young fellow who had raised his first lot, and he had good stuff. I asked him something about prices, and when he began to tell me, I said, "Hold on. By telling me those prices you have told me that you are quitting the business, for no man can keep it up. No man can bring in the best stuff, grow it and feed it and develop it, and make the prices you are making and be a man among men. Now, quit it. Be master of the situation."

Get honest prices and give honest goods; do a legitimate business and make a legitimate profit. That is right, and it is ridiculous for a man to start any other way. Of course, you must know what is right, and you must know your herd. I have seen fellows that did not know the head of their herd, and they had hardly two hogs that looked alike. They did not have a herd, they simply had a lot of hogs. Such men will never advance the breed. A man must have his ideas and his ideals.

Smith and Jones got a little too much fire water, and did not know just exactly the way home. Finally they got to one of the homes, but they did not know which it was. But they managed

to ring the bell, and a woman stuck her head out of the window and asked who was there. They asked, "Does Smith or Jones live here?" "Mrs. Jones," was the reply. "Well, Mrs. Jones would you mind coming down and picking out Jones, because Smith wants to go home."

A fellow that does not know his type, that does not have an idea of practical business, will get just about as far as these two fellows. Be master of the situation. Talk up your type. Breed what you think the people want. Look not one year ahead, but two, or five, or seven. By the way, that is just the thing we did not do this year. We fellows were all caught a little short. If there is a man of any breed that has a great big lot of stuff to sell, he is to be congratulated. We did not raise quite enough. That is another point,—raise plenty.

Then again, we ought to be warm-hearted. I am glad to stand here and say that I do not like these fellows that go around with a chip on their shoulder, criticizing every other breeder and breed. I do not like that kind of business. There is no use in our being cold toward each other; that is all wrong. The other fellow has good stuff, and we ought to be the very best of friends.

Then, we want to raise plenty. One breeder said to me to-night, "Morgan, I do believe that the greatest mistake that a breeder can make is not to raise enough so they can cull it." And I know if I thought I was going to sell one hundred hogs, I would want to raise two hundred,—then I can make a selection. Don't you like to sell a hog to a man and have him say, "I tell you, if I could always buy stuff like that, there would be a difference in my finances. But I have been bit so many times in buying." Of course, you cannot sell a man something you do not have, and the trouble is sometimes you send him something you would rather not send, only you want his money!

I do not know what more I can say on this subject tonight. It is not my place to talk prices,—my business is fundamentals. I have talked more about the man than the breed, and I will say to you, take any breed that you get in your mind that you can make better than the other fellow,—the stuff that will go out and make the buyer successful. A man that is coming to buy a lot of hogs wants to make some money, and it is up to you to have something to sell him that will make him money.

I was standing the other day in a great city and saw the schools pouring out their thousands of children, and in my mind's eye I saw this great country of ours, with its millions of school children. And then I stood where I saw a great train go by, loaded

with cattle and sheep and hogs, and the thought passed through my mind that the man who is feeding these thousands upon thousands of children, and the women and little ones, the man who is giving bone and sinew to this great country of ours, is indeed a wonderful man. We have no reason to be ashamed of our business. I am a preacher of the Gospel first, but I would like to be known as an honest man who tried to do an honest, legitimate business along lines that are right, helping to put bread on the table of the laboring man, and bettering conditions by the efforts I make. Incidentally, of course, I would like to gather up something that will be a help to me when old age comes on and I am not able to do the work I am doing now.

I thank you for this privilege of speaking to you for the first time, and if I have started a line of thought that will be of help to you, I am glad for that much. (Applause.)

Discussion.

Mr. Coleman: I do not think there is anything more important than the principles we have just heard discussed, and I would like to hear a little further discussion on this subject. Mr. Mugg, you have had a good deal of experience, we would like to hear from you.

Mr. Mugg: It is a subject I have not thought much about, and therefore I am not able to talk on it. Of course, I think Mr. Morgan handled the subject very nicely, and maybe what I would say might not agree with the people as well as what he said.

I have bred Poland-Chinas for forty-three years, and it is pretty hard to tell whether I have made a success of it or not. But I differ a little from Mr. Morgan in some things. I think the people change. They make up their minds they are honest when they are not honest, and it is pretty hard to tell when a man is honest. Indeed, it is pretty hard for a man to be honest. Did you ever think of that? It is a pretty hard thing. Now, as to giving the people what they want, the trouble is they don't know what they want, a good many of them. I may not be right, but I believe the best thing is for a man to make a study of a man when he comes into your yard for something, and make up your mind what kind of a man he is. There is the man that if you would show him the best hog in the world, he would not believe it was the best. Some want one breed, and some want another. I have always taken the stand that I would have a breed of medium size. I have been lucky enough, generally, to sell all I can raise.

Then you take the people who are uneducated in the business, and they don't know what they want,—they don't know what to buy. Therefore you have to have some of different kinds, because they will not buy a good hog if the price is high. All they can see in a hog is the pork barrel. Life is too short for a man like me to try to educate the people. I have made up my mind to find out what kind pays, and raise that kind.

Morgan thinks it is better to raise more of them, but I don't know about raising two hundred, unless, of course, you are going to market them. My idea is not to raise so many for breeding, but to take better care of them. The very best cannot be made good unless you take care of them. I would take one hundred instead of two hundred.

So you see, I do not just agree with Mr. Morgan, and I think I had better quit talking.

Mr. Morgan: I do not mean that I would breed two hundred ordinarily. But if I knew I were going to sell one hundred, I would like to have two hundred to pick from. That is what I meant. I did not mean that I would try to raise two hundred, for I am not in position to raise that many.

Mr. Farquhar (Modoc): The subject has been ably and well discussed, but we all have our ideas about it. It occurred to me while Brother Morgan was talking, that it is pretty hard to judge a man's honesty by what the animal does after it passes from his hands. I do not object to what Mr. Morgan said, but from my own experience where I sold the same breed and type, and as far as I could see one was as good as another, but they went into different hands, and one was pronounced a fraud and the other a success, simply because of the care they had afterwards. So the breeder has a pretty hard proposition to please everybody. It is a hard thing, and the longer I live and study it, the more I conclude that sometimes I don't know anything about it.

But one thing I believe the breeder ought to do, or rather, ought not to do. I do not believe he ought to sell a breed animal that he would not use himself. I find that a pretty safe guide to go by. I think that is one of the fundamental principles. Brother Morgan has touched upon that. And right now is a trying time. I do not suppose there is a breeder here that has been able to supply the demand, and there has been such a call for hogs that we have been tempted to sell animals that usually we would not sell.

I believe in a clean business, because when you put out an animal it lives afterward, whether for good or evil. But I have

my serious doubts whether we will ever be able to put out animals that will be a success under all circumstances and all care. When you sell animals you have to have them up to a certain type, and if they go to someone who does not take care of them, they will go back. I believe that is all I have to say.

Mr. Coleman: Mr. Fletcher, who was to speak on "The Ultimate Destiny of the Hog," is not here, and in his absence I will ask Prof. Skinner to occupy that time on the program.

Prof. J. H. Skinner: Mr. Chairman: It is hardly a fair proposition to be called on for a talk without anything to say. Mr. Coleman said to me a bit ago that he might call on me if Mr. Fletcher was not here, and I said I would pray that Mr. Fletcher would come.

There are many things that might be taken up. One is the question of foods. I know that a good many of you have heard at farmers' institutes and various meetings something of the work that our Experiment Station is doing along the line of feeding, but probably we cannot consider that subject too frequently, especially in the light of the present prices of feed. I hear a great many discussions as I pass around over the country at this time of year, and particularly this year, in regard to whether the farmer is getting too much or too little for his hogs. My friend Mugg and I had an argument here this evening. He contends that hogs are too high. There are a great many view points to be taken into consideration. Sometimes we are too prone to consider the other fellow. Mr. Mugg's contention is that hogs are so high that the average laboring man in the towns and cities is unable to supply his demands for meat. My view point was that the farmer was not getting more than the hogs were really worth, and I say that taking the situation as we have it in this country today, with pork going higher and higher—and that is a subject that might be profitably discussed here this evening—and foods relatively higher—corn 55c at this time of year, and middlings I suppose at your home mills, \$22 to \$28 a ton, and other foods in proportion—I say the feeding of hogs becomes a serious proposition.

The stations all over this country are doing quite a good deal of work along that line at this time. I know all you breeders have been thinking about it, and yet I venture to say that a good many farmers in Indiana who are feeding hogs are doing so at a loss, even at the high prices. As I pass around and occasionally observe the farmers who are feeding hogs, I am satisfied that there are a good many farmers, even with the high price of hogs, that

are not making money, and to me that means that he is not using the best methods.

Now, to revert for a moment to the address of Mr. Morgan. One of the fundamentals in successful swine breeding, it seems to me, is the application of business methods to this proposition. I see before me this evening men with gray hairs, who have been in the business anywhere from twenty to forty years, possibly fifty, and who have been successful in more ways than one. They have been successful financially—they have been successful in meeting the proposition laid down by Mr. Morgan, that of satisfying the public, as we can find testimony all over the State. But the future is a different proposition for us. I was thinking awhile ago, who are the young men? I am speaking of the young fellows, not those who have been in the business for six, or ten, or fifteen years, but the fellows who are beginning today. Who are the swine breeders of this State? Where are they? There are not very many that you could put your finger on today. Most of them are middle-aged men, and the future of the swine business in this country demands business methods. Why are hogs so high today? Can anybody say? There are a great many views expressed by different men. I was down on the Ohio River at an institute a week or so ago. I met some very intelligent farmers, and this subject was discussed. Some one said the trusts were responsible for it. You know we kick the trusts for everything that is good or bad. But I want to say to you that the thing as I see it today is the fact that the farmers are not raising hogs, whether it is profitable or not. As Mr. Morgan said this evening, there are not very many breeders but could sell a few more if they had them. One man down there on the Ohio said he had seen wagon-load after wagon-load of brood sows going to market, indicating that the farmers were letting go. That is the tendency of our high-priced feed, and if you will look closely and study the situation you will find that the reason why hogs are so high is that the farmers are not growing as many as they did a few years ago. A good many farmers are inclined to say that there is too much risk, with the high price of feed, for a man to go into the business, and that a more satisfactory profit can be made out of selling the corn.

The people of this country must be fed, and there are a great many people who are concerned about that; but I am not worrying very much about feeding the people. Mr. J. J. Hill, the railroad king, says that the young men are leaving the farms and therefore production is not keeping pace with the increase in

population. But he fails to point out the effect of the introduction of improved methods of farming. Take the work of one man, McCormick, and see how many men he has made it possible to remove from the country districts,—and still we feed more people than we did. By the use of improved machinery we have removed the necessity of so many men on the farm. But the people must be fed, and we cannot hope to feed them unless we encourage people to go into the various lines of agricultural work, and one of the best is that we are discussing—the swine breeding business.

New methods are put before the people of Indiana, as far as agriculture is concerned. These older men in the swine business made it a success, but the young man today who is going into the swine business must consider it in a different way. He must get down to the business end of this proposition and know exactly what it costs to produce a pound of pork, if he is producing for market. He must know what it costs to put this pure-bred hog on the market, and where the profit comes in. Most of you measure your success today by your accumulations. You have not measured it by the profit on this or that, but you have gone along and accumulated. But the young man of the future must study this work and bring into action methods which you have never thought of, if he is to be successful. And so when I talk to you I bring before you this question of feed. In Indiana in past years we have seen corn so cheap that it was more profitable to waste half of the corn food than to buy other foods and mix with the corn to make the proper ration. And today corn is 55c in winter, and most people are expecting it to go higher. And, as I said, other foods are high-priced, so we must look to this question of foods, and study the question of providing not only corn, but other foods for swine as well as corn. It has been said, and probably truly said, that without corn we would have no hogs. But I wish to make one little bit of prophecy here today,—that before I am as old as some of the gentlemen here, we will not feel that corn is so essential to the ration of the pig as we do today; that some other foods are bound to come in and take the place of corn, which is bound to serve in many places as human food, and we will raise just as good pork and just as much of it, and possibly cheaper than we do today on corn. Our experiment stations are at work on many problems that seem to indicate that we have over-estimated, if it is possible, the value of corn. I think the average farmer as a rule nowadays has a very remote idea of the value of corn. The work of the experi-

ment station does not apply simply to the feeding of swine, but the whole realm of feeding which will be revolutionized, if I am not mistaken.

I might mention just one crop that, if Indiana farmers come to learn to grow successfully, will revolutionize the whole business of swine breeding in this State. That is alfalfa. Some of you men are growing a little alfalfa, but there is not a man here who can speak of its value. Some of the work that the experiment stations are doing along this line will eventually reduce the cost of feed for hogs very materially, and thus make a greater profit for the young man who is going to take up the business. We have found at our own station that no matter what sort of combination we make, where we use two or more foods to make a complete ration, when we compare the sole ration of corn with the ration of properly balanced foods, the latter makes much cheaper pork than where we feed corn alone. I do not know the present price of packing house products, such as tankage, but fed in small quantities it is one of the most profitable foods we can use. It has some objections, but it is used very widely, and it enables the feeder to get a greater profit and put the product on the market at a lower cost than on corn alone.

The same is true in this State with skim-milk. If you take the results of our station experiments you will find the cheapest food we can get to use with alfalfa and corn is this dairy by-product of skim-milk or buttermilk.

One of the fundamental principles—and nearly all of you men know it, because you are breeding hogs,—is the fact that a mixed ration is better than a single ration almost every time.

As to the future of the swine business, I wish to say that one of the fundamental principles of the future is the application of business methods that will enable the farmer to know exactly what his pound of pork costs. I know some of you older men will say that this is too much trouble, and that if you have to do that it will never be done. But the young man must be trained in a different way, and I wish to say that Indiana today needs to have many young men encouraged to take up this business of swine breeding and growing, men with a new view point, men who will go to the bottom of the thing and start on a business basis and apply business methods, the same as a merchant. There is not a merchant in the city of Indianapolis, or any other city of its size, or in a smaller town, that could exist financially for five years, if he used the same methods the average farmer uses in his feeding of swine. You will agree on that. But the young men must

be instructed. You older men instructed yourselves, but the young men must have a new view point which will start them right and encourage them to go on with the business. It is one of the best lines of work a young man can take up, but he must have a new view point.

Mr. Mugg: Do you think alfalfa is better for the hog than a little red clover?

Prof. Skinner: The alfalfa has shown superior results in experiment work. That is as far as I can answer. I might say that alfalfa contains more of the muscle building food—the protein—than clover. Another great advantage of alfalfa is that the crop grows continuously from year to year and produces more than red clover.

Mr. Mugg: Will it do it in Indiana?

Prof. Skinner: I think it will.

Mr. Mugg: I have tried it twice, and it did not do any good.

Prof. Skinner: It will produce a larger amount of forage. But Mr. Mugg's experience is a common one. I run into it all over the State. "I have tried it and failed."

Mr. Mugg: Do you not think a man could get three crops of little red clover?

Prof. Skinner: If he can get three crops of little red clover he can get three of alfalfa.

Mr. Mugg: It will produce more to the acre than alfalfa. I don't believe this is a good State for alfalfa.

Mr. Sid Conger: The hogs will eat alfalfa before they will eat clover. They will eat it every bit. I just put it in racks like I use to feed sheep, and they eat it up clean. The cause of your failure may have been your fault.

Mr. Mugg: That may be, but I believe it is a harder proposition than clover.

Mr. Conger: If you get a stand once it will stay there. You sow it about August 15th, and it will grow.

Mr. Mugg: I believe I didn't sow it right.

Prof. Skinner: Some people might take exceptions to me in regard to alfalfa. I am an enthusiast. I have associated with Joe Wing a little bit, and I was out West where they grow it, and I have seen excellent fields in Indiana, and I think the whole secret is this—if we learn to grow it we will grow it. I am not saying you do not know how to grow alfalfa, Mr. Mugg, and the fact is people in this climate are finding difficulty in growing alfalfa, and our conditions are not adapted to the growing of it as out in Nebraska or some of the semi-arid states; but we have

men all over the State successfully growing alfalfa. We have a man over here—some of you know him—Mr. Snow, over northeast in Hancock County. There is a man who has gone into the study of alfalfa just as a man would go into a laboratory and work out an analysis; he has dug into the soil and studied conditions, and he is growing alfalfa. But there are a whole lot of things that we have to learn about growing it, but when we do I venture to say there are very few swine men but what will grow it. I think a lot of us fail simply because we have not found all the factors it takes to make success in alfalfa growing.

President Coleman: Before adjourning I will announce the following committees:

Committee on Resolutions:

Mr. Mugg,
Mr. Harvey,
Mr. Morris.

Nominating Committee:

Mr. Farquhar.
Mr. Horton,
Mr. May.

I also wish to call your attention to the program tomorrow morning. We have two practical papers on foods, and Dr. Craig will read a paper on "Serum Treatment of Hog Cholera."

(After a further announcement regarding the banquet, the meeting adjourned.)

Wednesday Morning, January 5, 1910.

Meeting called to order by President Coleman.

Mr. Coleman: I earnestly hope that every man in the room will become a member of the Swine Breeders' Association, and we have been giving some extra time for that this morning. I think it is due to you that you should affiliate yourselves with the Association that stands for harmony in all breeds and advancement of all. I hope all the men here will feel that we have a program which, while it may not be worth so much to you now, will benefit you after you go home, and that you will be benefited further by the fact that you are associated as a member of the Indiana Swine Breeders' Association with men that are doing things, and that will spur you on to better things.

The membership fee is nominal, but we need the money and we must have you. We hope you will help yourselves by becoming members of the Indiana Swine Breeders' Association. We will have an intermission later on, so that you may avail yourselves of this opportunity to join those men who are doing things in the hog raising business.

We will now have the report of the Nominating Committee.

Indianapolis, Ind., Jan. 5, 1910.

We, the Committee, recommend:

For President, M. I. Harvey, Zionsville.

For Secretary, T. E. Lindley, Russiaville.

For Treasurer, A. I. Foland, Frankton.

W. T. Farquhar,

Adam Fay,

W. E. Horton,

Committee.

(Moved and carried that the report be received and the committee discharged.)

Mr. Coleman: In explanation I wish to say that it was my request, and no doubt your earnest desire, that a change be made in the presidency. I feel it is for the good of the Swine Breeders' Association to change the president annually. The secretary, of course, is the man who is supposed to do the work, the president being merely an honorary position; but his business is to help with the program, and new men will bring new ideas, so I think it is for the good of the Association to have a change each year.

ALFALFA IN THE RATION.

W. E. Horton, Rushville.

I first became interested in alfalfa some six years ago, and have been well paid for the seed and labor expended.

First, alfalfa being very rich in protein, it furnishes a successful balance for our corn ration.

Second, I find one acre of alfalfa will furnish more forage for swine than two of clover, as it grows faster and keeps growing all season, and if judiciously treated makes an ideal hog pasture from early spring to freezing weather, thus saving the price of high mill feed and endless labor. As alfalfa starts earlier in the spring than clover, it makes a better pasture for brood sows and young pigs. It is a great milk producer. This gives the pigs an early start growing, and gives them good strong bone and great healthy frames for future breeding and feeding as desired.

I believe we can learn something from the West and Southwest, where alfalfa enables swine breeders to send to market vast numbers of bacon hogs without any grain feeding, and with a small ration of corn or other grain they finish their lard hogs and compete with our high-priced corn-fed ones.

Alfalfa hay, when well cured, is a good winter ration for brood sows, fed either dry or steamed, but I consider pasturing in season the more satisfactory and beneficial way of feeding.

Now, a word as to getting a pasture started in alfalfa. With proper knowledge of the plant and the right soil conditions, I do not think it any more difficult to grow than forty bushels of wheat or eighty bushels of corn per acre, and as alfalfa only requires one sowing in five or six years, this is something in its favor.

Discussion.

Mr. Coleman: I asked Mr. Horton to introduce this subject because it is one of interest, and we want every member to discuss it. We will now have the discussion.

Mr. Brendel: He said he thought to pasture it was the best way to get results. I have always been under the impression that it was not the most profitable way to feed it. In other words, it killed it out to use it for hog pasture. Now say you had three or four cuttings and put it away in the shape of hay to feed during the winter when there is no grass, would not that be a more economical way of using it?

Mr. Horton: We commenced with it as a hay crop to feed cattle, and found it just what we needed with ensilage and corn. Once in a while the fence would get down and the hogs would get in, and we found we would not have any hay, but that was just what it needed. Whenever it gets to a certain height, if it is not mowed it begins to die. Of course you do not want to turn hogs in when it is thawing or freezing.

Mr. Farquhar: You said it only needed seeding about every four to six years. Is that the life of the stand?

Mr. Horton: It has been known to make a stand up to eight years, but I think up to about four years is as far as it pays. I think it ought to be re-seeded about every four years.

Mr. Farquhar: In seeding you would break the ground up, I suppose?

Mr. Horton: I have tried it both ways, in the spring and with corn. We first sowed it with corn, after about the third plowing, and for my part I believe we got better results with the corn. Mr. Shirley, a Philadelphia man, recommended that way of sowing it. He said he got just as good results from sowing with corn as any other way. You get an ideal seed-bed, free of weeds.

Mr. S. C. McCowan (Danville): I would like to ask what is the percentage of protein?

Mr. Horton: It is claimed that the protein varies from 16% to 18%, which is higher than either clover or wheat bran.

Mr. Brendel: I had a card from the Lafayette Hominny Mills in regard to the price of alfalfa meal,—\$27 per ton. I was figuring on trying it. Is it worth that for feeding purposes, taking shorts at the same price, about?

Mr. Horton: I never fed any of the meal, but I think there is a large amount of it fed. They ship it clear East and use it there. That is getting to be one of the biggest industries of the West. I never fed any of it. Ask Professor Skinner.

Prof. Skinner: We have made no experiments with alfalfa meal, but as Mr. Horton has said, it has been used quite extensively with many foods in Illinois, Ohio and Indiana. I do not know the analysis of this particular brand you mention. Do you know what it calls for?

Mr. Brendel: I do not know.

Prof. Skinner: It would be impossible to know just what it is in that respect. One thing you must take into account, and that is that this food has a good deal of fibre in it. I should say you could not feed a very large proportion in the ration. I am un-

able to say just what parts you should feed,—there are so many different brands. Of course, all the alfalfa meal that we get should be tagged by the State Commission tag, showing the amount of protein and other constituents, and that would help a good deal. But if you will refer the question to me at the Station, I will be glad to give my opinion regarding it. But I would say that is a good price for that meal, as compared with other foods that might be purchased, for instance, tankage.

Mr. Farquhar: You say that it is strong in fibre. Would it be possible that that fibre would injure the digestion more than would show up in chemical analysis?

Prof. Skinner: The more fibre you have the more you reduce the digestibility, but of course you cannot say as to the digestibility until you have an analysis.

Mr. Russ: You would be paying perhaps one and one-half times as much for protein in alfalfa meal as in tankage?

Prof. Skinner: Yes; the protein would cost you very much more, about one and one-half times as much as in tankage. Of course you get other benefits from the use of the meal.

Mr. Coleman: Do we understand this is ground alfalfa alone, or has it a filler?

Prof. Skinner: That depends upon the make. I am not familiar with this brand. Some of it has molasses and some other filler; but if it is straight alfalfa meal, it surely means ground alfalfa. Some men are using it in place of bran. It is similar to bran, if you get it straight. It gives you bulk and about the same amount of protein, and possibly has some tendency to avoid constipation. The qualities are very similar to bran. As an illustration, Mr. Kurtz, who handles a great many horses, grows one hundred and twenty acres of alfalfa on their farm, and they put in a big mill to grind the alfalfa, and substitute it for bran.

Mr. Coleman: Bran, as I remember it, analyzes something like 14% protein?

Prof. Skinner: Yes.

Mr. Coleman: And this shows 16% to 18%.

Prof. Skinner: Yes. *

Mr. Coleman: Then bran at \$27 is a higher priced food for protein than alfalfa meal?

Mr. Farquhar: What is tankage in analysis, about 60%?

Prof. Skinner: Yes.

Mr. Farquhar: We will say the guaranteed analysis of the alfalfa meal is 18%. Now which of the two is the most valuable for the animal, tankage or alfalfa meal?

Prof. Skinner: The tankage will have the greater per cent. of digestible protein than the alfalfa. It is presumed that tankage is largely digestible, but there has been very little work done on this subject of tankage.

There is one point that Mr. Horton brought out that I am sure is of interest to us, and that is the steaming. I understood you to say you steamed the alfalfa hay for your hogs. It seems to me that is a very intelligent idea. I would like to know how many men in the room are growing alfalfa in a greater or less area on the farm. Some half dozen or more. The reason I mention this matter of steaming, most of the men feeding dairy cows today, on account of the high price of feed, are adopting the plan of steaming the alfalfa. It softens the fibre materially, and the animals consume all of it, and the steaming adds to its digestibility. I think this is a good point, although it may be a little difficult to carry out.

Mr. Horton: It is not hard to steam, and they eat it up cleaner; you do not waste any of it. Take a bed of hay, and they will eat the best of it, but there will be the stems left. But where it is steamed they clean it up the same as mill feed.

Prof. Skinner: And they will digest the greater proportion.

Mr. Coleman: The question of getting a stand is the rock on which many come to grief.

Mr. A. C. Hodson: I have been enthusiastic about alfalfa, but I have not been able to raise it. The stand is the proposition. I began in the spring and plowed the ground and tended it like a garden. I sowed along after harvest,—in August is a good time. This last summer I have been over to the Wings' farm and seen the way they raise it, and I tried their plan, sowing fourteen acres in spring barley and alfalfa, and had a nice stand, apparently, but my ground either was too rich or had not been prepared right before, but the weeds took it, and it is in wheat now. It discourages a man. I find there is only one way to do it, and that is to tend it like a garden. If there is another way I would like to start again.

Mr. Horton: I would like to make a suggestion. If in the first place, you have your ground well drained, and it is rich enough to grow eighty bushels of corn, break your ground early, the first ground you break in the spring. Then work it thoroughly and put it in corn, the first corn you plant. Plow it about three times, harrow it and level it. Then drag your ground after a rain, along about the time you would commence cutting clover hay. If you ever get any rain it

will be then. Sow it after a rain, not before. Sow your seed, then drag your ground again after you sow it. Then get out of the field.

Mr. Coleman: Have you had any experience in using a starter in the way of commercial fertilizer for alfalfa?

Mr. Horton: I do not believe in manuring the ground, that is, spreading it over. I would rather put a fertilizer on. Three hundred pounds to the acre will not hurt it. A five-holed disc wheat drill is a good thing to sow it with. But the main thing is to dig and harrow and get your ground well worked up in the spring. Plow at least three times, and four times is better. Work it before you sow and after, and sow it after a rain instead of before.

Mr. May: I don't know anything about alfalfa. Mr. Horton says to sow it after a rain; but if he can tell me how he knows he is not sowing it before a rain, I will treat the house.

Mr. Horton: As a general rule we have a period of rain. If you get a good big rain, and it gets dry enough, go ahead and sow it.

Mr. Harvey: I have been working with alfalfa for three or four years, and I have asked every man that I knew or that had any experience with it, about the time to sow, and I find the experience differs quite a good deal. One will say sow it in the fall, and one in the spring, and that rather mixed me up. So I got all the ideas I could and put them together,—and then went ahead as I pleased. I sowed it in wheat stubble this year, about the tenth of August. I have clipped it once since, and I have a splendid stand so far. I sowed twenty-two and a half pounds to the acre. I told my man to sow one-half one way, and then we would sow the rest the other way. We sowed one-half one afternoon, and that night came a rain, so we could not work in the alfalfa; then we sowed the other half when it dried up a little, and then there came a rain, and by the time it was dry enough to work the first sowing had sprouted. I did not know what to do. I always had an idea that to cultivate weeds in that stage would kill them, but I thought the heat soon would kill the seed, so I went ahead and harrowed it, and I have a good stand. I did just opposite to what the gentleman says he did; I broke the ground and manured the ten acres with stable manure.

Mr. Horton: That is all right if it does not freeze out. So far as rain is concerned, you got rain. So many fellows will wait to sow it, and the ground is warm and it kills the seed before it germinates. There is much in sowing it after a rain.

Mr. Logan: It occurs to me that this discussion has now got into the right line. It is no longer a question with us as to the food value of alfalfa, but the question with the Indiana farmer and breeder has been and is now, how to get alfalfa.

The steaming is all right. I have a steamer to steam red clover. But I would like to know the cause of my failure with alfalfa. Let me give you my plan. The field was plowed in early spring, being a field of average fertility or better. I plowed early and got a good seed bed, planted it in corn the first week of May, thoroughly cultivated it so that no weeds were allowed to grow. I sowed the alfalfa just after the last cultivation of corn, which was perhaps in harvest time. The alfalfa came up, I had a good stand, and it grew until fall. It did not get very large, of course, but the ground was well covered. By March 1st there was no alfalfa alive in the field. The field was broken in early spring again, as though for corn, and thoroughly cultivated. However, before I broke it this time I put considerable stable manure on the field, plowing it under. In May, after the second cultivation of the soil for seed bed preparation, I took a two-horse wheat drill and sowed about three hundred pounds to the acre of good quality commercial fertilizer. Then I cultivated again until the last part of July, when I sowed alfalfa. Got a very good stand; clipped it once in the fall.

We had been two years now, with ten dollars an acre expense for seed, besides the commercial fertilizer and a great deal of labor, but I felt I would surely get a stand this time. The next spring the alfalfa was there, and started to growing very well, and I felt sure our mows would be filled to overflowing. We first cut it about the time it began to head nicely, and we put that up for hay and got it cured very nicely, got half a ton to the acre. The next cutting, while a good stand, we got about half as much. But I forgot, we inoculated the field that spring. The third cutting we waited a little too long, and there was about ten per cent. of it dead in patches here and there over the field. We were somewhat discouraged, and in March of the next year there was half of the field dead. One-half of the field was plowed for oats, and last spring the other half was put into other cultivation. There was no alfalfa there. It did not pay us.

One of our neighbors has a piece of alfalfa, and after two cuttings the next year he concluded he would let the hogs in it, and they had access to this three or four acres of alfalfa, together with ten acres of good red clover, and after three months he had no alfalfa. Now, I ask you, what is the matter?

Mr. Horton: I cannot see in your first sowing. I think your last sowing was too late. It should have been sowed by perhaps the middle of May.

Mr. Logan: I got a good stand, and it carried through the year well, and the first and second cuttings were all right

Mr. Horton: Are you right sure that the soil you got from this field was inoculated soil?

Mr. Logan: It was from a field where alfalfa had been grown for several years.

Mr. Horton: Was it good alfalfa?

Mr. Logan: They said it was.

Mr. Horton: You can get good soil from any field, but if it is not well inoculated it is of no account. I have an idea that was the trouble.

Mr. Hodson: I went right into the field where they were putting it up and got soil to inoculate my field.

Mr. Logan: I have known fifty farmers to try alfalfa, and out of fifty, three met with success.

Mr. Horton: Did you have your soil analyzed?

Mr. Logan: No sir. It is a sub-soil, a soil that is mellow away down.

Mr. May: I would like to ask a question. Did I understand you to say a moment ago that you sowed this alfalfa with corn about the time you quit plowing for corn?

Mr. Horton: About June 20th; about clover hay cutting. I sowed once in May. I have never had a failure. While the first sowing was not as good as the other two, yet I cut it for hay. Once it was too wet; it was not thoroughly drained.

Mr. May: Do you cultivate your corn after you sow this alfalfa?

Mr. Horton: No, sir; but I tell you what I have been doing. I have always cut my corn off and put it in the silo.

Mr. Logan: My corn was cut off and put in a shock.

Mr. May: As I understand him, he says he aims to sow it about June 20th, but when the old gentleman across there was talking awhile ago, I understood Mr. Horton to say he sowed the last sowing too late, that he should have sowed about the 20th of May. Now, Mr. Chairman, I have this to say. Mr. Horton says he does not cultivate his corn after he sows this seed, and if he does not cultivate his corn after May 20th, he lays his corn down sooner than we do in Shelby County.

Mr. Horton: This corn was not cultivated twice. It made eighty bushels to the acre.

Mr. Hodson: Do not get enthusiastic over alfalfa until you try a little patch. Mr. Harvey thinks he has it—he has a good stand. I had a stand just like it, and there came a hard freeze and I had to plow it up for corn. I had the best corn I ever had. The fact is you have to tend it like a garden patch.

Mr. Horton: I do not think so. The first I ever sowed in the spring was a piece of ground bought from a widow woman, a piece of about three acres that had been rented out and farmed in beans and corn and everything. It was weedy and wet and run down, and the first thing I did was to put a ditch through it. It was along the Big Four. I went to work to break it up as soon as I got the ditch in, I worked it down and let it lay and then worked it down again. I sowed six hundred pounds of fertilizer on that three acres. Then on May 14th I sowed it and I got a splendid stand, and it is a good stand yet.

Mr. McCowan: Did you use any lime on your land?

Mr. Horton: No, I never used any lime on my land.

Mr. Brendel: My notion is this. Our land in central Indiana is a whole lot richer than the land in the West where this alfalfa grows, and where the climatic conditions are more favorable. Kansas and Colorado do not have as rich soil as we have here, but the conditions there are different. I think our climatic conditions are not favorable.

Mr. Horton: I would like to say a word about inoculation. The first time I tried inoculation it looked like foolishness to me; I did not think there was anything in it. Indeed, I told the man to go and put the soil on the field, and I went off to another part of the farm; I didn't want to see it done. But it came up and grew very well for the first cutting, but it was a damp, rainy spring, and it did not do well. I sent over to this man Shirley and got soil and put it on all over, and that spring it was so dry that the ground was cracked all over. But there came a big rain, and in a few days it started, and in a month from that time you would not have known it was the same patch of ground.

Mr. May: I would like to ask Mr. Horton what he means by inoculated ground. Is it from a richer field? Do you scatter it over?

Mr. Horton: No. There is a great difference between our land and the land in the West. The West is naturally adapted to the growing of alfalfa, the same as our land is for clover. There is land in our county on which alfalfa has been grown without inoculation, but the majority of it does not have the bacteria. They have to inoculate their land to grow clover out West.

Mr. May: It does not make any difference, then, whether the soil is better or poorer?

Mr. Horton: Not a bit.

Mr. May: I just wanted to say that if you want to get rich soil, come down to Shelby County.

Mr. Horton: The best I ever saw was in Shelby County. That was where I got interested in it. I went down to Mr. Hill's to buy some cattle, and it was enough to interest anybody to see that alfalfa.

Mr. Farquhar: If I were to give my experience, it would be that I have had no experience. I commenced some three or four years ago trying to study how to get a stand of alfalfa, and two or three times I thought I had the right idea, and then it would be all knocked out of me. I have come to this conclusion, that we have not the natural conditions for it. They must be acquired, and we have a variety of soils. People in our county are making a success with alfalfa; they think it is the thing, but men right close to them have failed,—apparently the same kind of soil. I have come to the conclusion that every man must work it out on his own farm. Possibly some of us can raise more good corn, or raise something else and buy alfalfa cheaper than we can raise it. I doubt in my mind whether the alfalfa raised in Indiana has been worth as much to the farmer as what has been spent on it.

Prof. Skinner: I would like to have a final word. I stated last night that I was an enthusiast on alfalfa, and I believe the day will come when these men who are talking against alfalfa will say as Mr. Horton does, after they have succeeded in growing it, it is worth all it costs. There is no question but what the subject is one that needs a good deal of thought and a good deal of study and I believe the breeders and stockmen and farmers ought to discuss this subject. I do not claim to be an alfalfa expert, and I am not talking from that standpoint; but I have seen so much alfalfa growing in Indiana on various kinds of soil. There is a man with one kind of soil, and here another, and here another, and we have a great variety of soil. I have seen alfalfa fields on all kinds of soil, and that leads me to believe that we can make it a success here. We must learn the elements of our soil. When Mr. Logan learns what is needed in his soil, he will grow alfalfa. Until we learn how to grow it, we will have many failures, and it is true there has been a good deal of money wasted in experimental work by the farmers in this connection.

One point is, that the farmer makes a mistake in trying eight or ten or fifteen acres of alfalfa. It is a great mistake. Try an acre. You all know you can grow an acre of corn that will produce one hundred bushels, but when you try forty acres you do not get forty hundred bushels. Then, it is not so expensive. So I want to recommend first of all in this effort to grow alfalfa, that we do it on a smaller scale. It is not very expensive if we do it that way. If you put in ten acres, and throw that field out, it is a good deal of loss.

Now, there are some principles that we must understand in the growing of alfalfa. Prof. Wiancko will talk tomorrow morning on this subject, giving his experience in growing alfalfa in Indiana. But there are some things in this connection that ought to be known,—fundamental principles, and I will name these:

In the first place, you cannot raise alfalfa on land that is wet. You do not find it growing in its natural home on wet land. It will not stand wet feet. Many times the reason it freezes out is that the water comes up and stands around it. So drainage is one of the fundamentals. And I may say on that point that Indiana farmers in many cases do not understand what thorough drainage is.

Then following that, we must take into account the matter of tillage, because it is likely that in some cases failure is due to weeds. Tillage to get rid of the weeds and prepare the proper seed bed. You cannot throw alfalfa in as you do oats, and get a crop. You must have tillage to free the soil of weeds, if it takes five years. I am preparing a field that I have been working on for three years. You must have a proper seed bed.

Mr. Farquhar: You have been preparing it for three years—what do you do?

Prof. Skinner: In a moment. The next point I wish to mention is that many of the soils in Indiana are acid, and alfalfa will not grow on an acid soil. That may have something to do with Mr. Logan's situation. I do not know what his soil is, but that is fundamental. Alfalfa will not grow on acid soil. Wing Bros.' great success is due to the fact that they have used lime. Down on the Giltner farms in Kentucky, they could not grow alfalfa. Why? Because they had acid soil. But they put lime on it, and they are raising alfalfa today.

Then another matter is this matter of inoculation. I want to call Mr. May's attention to this. This matter of inoculation is essential. You have all dug into the soil and found where you have a good crop of clover, a little affair growing on the root of

the clover plant about the size of a grain of wheat. This is formed by a collection of bacteria. Now in the inoculation of alfalfa soil or seed we must bring some of these bacteria in touch with this seed or with this soil, so that when the alfalfa plant starts it will be inoculated. There are various varieties of bacteria—one for red clover, another for soy beans. These crops are called legumes. Alfalfa is a legume, and it must have the bacteria to be a successful crop. If you have a rich soil it will exist for a time without it, but to be a successful crop and hold for any period of time, it must have these bacteria, because they assist in the growth and development of the plant, and are very essential to its life, and particularly in the early stages of its life.

In Mr. Logan's case I think there are two things. He had a fine stand. If I had that and all the other things that are essential, I would feel safe. But he is not sure whether his land is acid or not. He took his bacteria from soil and put them on top of the soil, and the plants did not have a chance to become inoculated soon enough.

Mr. Logan: But I put this soil on just after the seed was sown.

Prof. Skinner: I misunderstood you. That eliminates one factor.

I may say that my reason for being so enthusiastic about alfalfa is because of the experience of men who have it, and because there are here and there all over the country, this State as well as others, men who are succeeding in a measure, as they solve the various problems that come up on their particular, individual soil. Up at Lafayette we have a heavy clay soil that must be well drained, and yet the Lafayette Stock Farm has one hundred and twenty acres in alfalfa—a great lot, more than any man wants. I just talked to Mr. Nowland, in the southeastern corner of the State, and he is very successful. He has not an enormous growth, such as they get in the western states, but he is very successful. And in the southwestern part of the State they grow alfalfa,—in Hancock and Rush counties. Up in Allen County men are succeeding with it, and whenever you get a field staked down, it will not get away from you. The fellows who are skeptical about it are those who have this discouraging experience, and I will say that not one out of a hundred men have been successful. It is a question for advanced farmers, but when you once get it you will be as enthusiastic as the other fellow.

Mr. Goodwine: Can you tell me what causes alfalfa, after it gets a start, to die down, or rust down?

Prof. Skinner: Sometimes there is a bacterial disease of the plant, and it should be clipped whenever the disease appears. You have rust on oats or wheat.

Mr. Goodwine: This came from Wing's seed.

Prof. Skinner: Sometimes it is due to the fact that the plant is not properly inoculated, and sometimes to the acid condition of the soil.

Mr. Hodson: How do you cure the acid condition?

Prof. Skinner: With lime.

Mr. Conger: I have good alfalfa. I have had it for eight years, and I am still cutting it. I have had one failure, because the ground was wet. I do not blame the fellow that has to go and buy somebody's soil and scatter it over the field. I have got the bacteria from the government every time, and I got a stand every time. The government man came along there about six weeks ago and dug down in it and showed me this bacteria. There is no sense in buying this, when the government will send you what you want and it will not cost you a penny. Alfalfa will grow on any kind of soil, if the weather does not freeze it out, after you get it started. But do not fool with this dirt proposition, because the government will not only give it to you, but send a man out to show you how to use it. It does not cost you one single penny.

I am going to keep on sowing, and sow in the fall from this on,—sow it about August 15th. I am inclined to think I will cut a little red clover and plow it up and sow right away. The trouble is the confounded wet weather after you sow it. But I am going to keep right on sowing it.

Mr. Horton: As to this dirt proposition. When I sowed this first piece, I did not think it needed any dirt, and now of course I have my own inoculation.

(After an announcement regarding the banquet, a five-minute intermission was taken for the purpose of selling tickets for the banquet.)

(After intermission):

Mr. Coleman: The Swine Breeders' Association is an auxiliary of the Indiana Livestock Breeders' Association, and we are entitled to three members on their Executive Committee, one expiring this year, one next year, and one the next. The term of Mr. Vinneledge expires this year, and we now elect a man to serve as executive member of the committee for three years. Has anyone a suggestion to make?

Prof. Skinner: Mr. Vinnedge has only served one year on this Board, and while I do not know what the idea of the rest of you would be, I would like to see Mr. Vinnedge re-elected for three years. He is interested in the work, and if he is elected I believe he will be a good man.

Mr. Horton: I place in nomination Mr. Vinnedge.

(Nominations closed and election made unanimous).

Mr. Coleman: The next number on the program is a talk by Mr. A. F. May, of Flatrock, on "Balancing the Corn."

Mr. May: I believe this is the last subject to be discussed. I have only to say that I did not know I was on the program for this talk until last night. I have not given a moment's thought to the subject, but as I understand it, it is simply what you feed hogs along with corn to balance the ration. I feed my hogs anything on earth that they will eat along with corn that will do them good,—bran, shorts, charcoal, ashes, hard coal, oats, barley, or anything I can get hold of. I will say, however, the best feed I ever got for hogs was a mixture of wheat and barley and corn, one-third of each in bulk, ground. I had better success with that than with anything I ever tried. I was getting a herd ready for a show. That is about all I have to say.

Mr. Coleman: This subject is now open for discussion. It is certainly a live subject, and follows very aptly the subject of alfalfa that we have just been discussing. Mr. Farquhar, have you anything to add to this?

Mr. Farquhar: I do not know as I have anything particular to add. I am like Mr. May. I feed a good many things. I think a hog needs, as an essential to success, to have something with the corn to balance it, especially the young hog. I like to feed clover, to let it have the run of a clover field, and then in addition to that when feeding corn I believe the best success I ever had was in feeding a good many things to balance. Year before last, especially, we used tankage. That is one of our standbys as a balancing ration.

Mr. Coleman: What proportion of corn do you use?

Mr. Farquhar: Now you have me. I simply feed it to the pigs and watch them. Some people advocate one-sixth, but I do not feed that much. I watch the pigs and feed it as I think they need it. We have no fixed ration. In connection with that I use a little oil meal sometimes, probably the next week some wheat middlings. I find on a variety of food they do better. Of course salt and ashes ought to be kept before them all the time, but I believe the pig needs a variety of food. I believe it is better to vary

the balance than it is to keep one identical balance before them all the time. We have used barley, and I thought a good deal of ground oats, and I also have used wheat in connection with oats.

Mr. Scott: I would like to ask the gentlemen what they find this time of year to balance the ration. It is easy enough in summer, but now for old hogs and brood sows what do you feed this time of year?

Mr. Farquhar: We are feeding sorghum with the corn. It gives them bulk and balances the ration. They clean it up, and it is the cheapest ration we have ever found.

Prof. Skinner: Are you feeding any tankage to your brood sows?

Mr. Farquhar: Not now, but we aim to along before farrowing time. Two or three weeks before farrowing time we feed the brood sows a little tankage. We have never had any ill effects that way.

Mr. Van Nuys: I have a self-feeder, and I have been feeding my sows corn and oats. How about tankage? Could you let the little pigs run to it and eat all they would take?

Prof. Skinner: I would be afraid it would cost too much money. Tankage is worth \$40 a ton. You can over-feed very easily.

Mr. Van Nuys: They were getting two-thirds corn and oats.

Prof. Skinner: I think you should have put in more tankage, in about the proportion of one to twelve or fifteen. I think the oats is an expensive food.

Mr. Van Nuys: I have been carrying my brood sows through on corn silage.

Prof. Skinner: The question is balancing the ration, and Mr. Farquhar and Mr. Van Nuys have been speaking of the use of corn silage. Now in both these cases you have been raising the percentage of succulent food. Neither of these foods are rich in muscle building material, so the tankage comes in, if it can be successfully fed to brood sows, to supplement that. The brood sows and breeding stock all need succulence, and there is no question about sorghum being an excellent food, and the silage also, if used in small quantities; but yet they do not furnish the material to build up the muscle and bone of the body. It does keep the system in good condition, and that is important. I have been a little surprised that Mr. Horton did not mention alfalfa. If you have nothing better, good red clover hay with plenty of leaves will be consumed in large quantities by your hogs. Some people in the state grow a few peas. They are an excellent food,

but are expensive to grow. During this winter period it is pretty hard for the sows to get anything. If they get blue grass, that furnishes succulence. At the college, I noticed just before I came away—some rye we sowed in August in some corn land. We took the corn off early for silage, and it grew up and fell down and made a mat of rye. The brood sows were in picking at that, and enjoying it, I can tell you. That is another good succulent food for brood sows.

Mr. Coleman: I heard Mr. Hodson say something about whole wheat, ground. Do you hull it?

Mr. Hodson: That depends upon the size of the wheat. I have fed whole wheat ground and mixed with barley or oats, but the best thing is to take the oats and let the sows work it out in this kind of weather, and I would not give anybody a nickel to grind it. That is the best thing for them. I am afraid of tankage.

Mr. Farquhar: What ill effects have you had.

Mr. Hodson: They expired.

Mr. Farquhar: I commenced with it in 1901.

Mr. Horton: What grade of tankage did you use? There are two grades. There is the \$35 tankage, and then the 60% comes at about \$41 at our town. I fed some of that cheap tankage, and I thought it gave the hogs cholera.

Mr. Hodson: I used the 60%. It is all right, but if you use it and get a cheap batch, what are you going to do about it?

Mr. Conger: I do not feed anything to my brood sows in winter but alfalfa in racks, where I feed my sheep. They eat it up. I do not steam it or anything else. They will leave corn and go to that alfalfa like hay. I just use racks like for sheep.

Mr. Goodwine: I have trouble to get my pigs to eat tankage.

Mr. Coleman: The only trouble I ever had was to have enough for them.

Mr. Brendel: You may have to teach a pig to like tankage, but there is no question in my mind but what tankage is the greatest thing we have to balance the ration throughout the year. We have used it with great success. I buy the 60%,—Swift's. Armour's is not as good as Swift's. It costs \$40 a ton.

Speaking about the amount of food, there is no criterion to give the amount of food. The last four weeks you would need to feed a lot more than the four weeks previous. If they can get grass, you do not need to feed so much stuff to balance the ration. You must use your judgment about that. We feed our pigs corn silage, and they like it. I do not know as it makes

them grow so much, but it gives them an appetite. They seem to do well.

Mr. Johnson: I would like to ask how to feed brood sows. You do not dare let the old sows have all they will eat, or they will get too fat. How do you go about it? How do you get the proper amount for each sow? That is the trouble I have,—getting the thing distributed to the different animals. I do not think the sows ought to have too much corn and tankage. If they like hay they will leave the corn and eat hay, and that is not good for the sow. She ought to have some corn. I would like to hear how some of the older breeders manage this.

Mr. Farquhar: I have fed oats to brood sows. If it is frozen like it has been, I get the snow off and scatter it on the ground so they will have to root for it and take some exercise to get it. We have had good results with sorghum. I throw it around the straw stack, and they eat it up. I take a wheat drill and stop up some of the holes and drill it about thirty inches apart and plow it through and cut it with a corn binder, and there are a good many heads on it. It is coarser than I would sow for cattle. They will chew up the stalks and eat the leaves. It gives the bulk to the sow which she needs.

As to feeding tankage, I just mix it in as any other feed. We are not feeding the sows tankage now. We will commence it a while before farrowing time.

Mr. Johnson: You are depending on oats now?

Mr. Farquhar: We are depending on sorghum, but if you have oats I do not know of anything better. There is a question with me if a man has oats that he has raised on the farm, whether it will pay him to sell it and buy bran and other things to feed brood sows.

Mr. Coleman: Mr. Kurtz has a resolution he wishes to offer.

Whereas, Since our last meeting Mr. J. H. C. Jack, of Judson, has been called to his final resting place, and

Whereas, He was a member of the Indiana Swine Breeders' Association, and held in high esteem by all the members and swine breeders generally, therefore

Be it Resolved, That we extend our sympathy to his bereaved family, and that a copy of these resolutions be spread on record and a copy sent to the family."

(Motion carried.)

Mr. Coleman: Dr. Craig has now arrived, and will address us on "Serum Treatment of Hog Cholera."

HOG CHOLERA.

Dr. R. A Craig, Purdue University.

Hog cholera is an infectious disease of swine in which the lymphatic glands, intestines, lungs, kidneys and liver are commonly inflamed. The inflammation is hemorrhagic in character, the lymphatic glands are grayish red or red, and the discolorations present in other organs and tissues may vary in size from very small spots to large, irregular areas.

Hog cholera exists in all sections of the United States, but it is especially prevalent in the middle west. In this section of the country it may be considered of greater economic importance than any of the other animal diseases. In our own state the average yearly loss is about \$3,000,000. It is difficult to make an exact estimate of the loss to the swine industry from this disease, as the statistics giving the death rate in swine include all diseases, but it is fair to assume that the greater portion is due to hog cholera. We should also include with the loss resulting from the high fatality, that resulting from the marketing of young hogs in neighborhoods where the disease is prevalent. This frequently amounts to 50 per cent. of the herd's value.

Causes.

The direct or specific cause of hog cholera is an ultra-visible organism, present in the excretions, secretions, and tissues of cholera hogs. De Schweinitz and Dorset in 1903 proved by inoculation tests, that filtrates made from virulent cholera blood containing no organisms demonstrable by microscopic examination, or cultural method, produced typical hog cholera in animals inoculated with them. They further showed that healthy hogs on exposure to the filtrate infected animals contracted hog cholera the same as in a natural outbreak.

The bacillus of hog cholera and bacillus of swine plague discovered by Salmon and Smith in 1885-6, were, previous to the publication of the investigations of de Schweinitz and Dorset, considered the direct or specific causes of the epidemic diseases of swine. After determining the infectiousness of the filtrate disease, these investigators proved by a series of inoculation and exposure experiments that the hog cholera bacillus did not produce typical hog cholera. Pure cultures of the *B. cholerae suis*, when injected beneath the skin (subcutaneously), seldom pro-

duced disease in healthy hogs, but when injected into a vein (intravenously), or administered in the feed, severe illness usually resulted. Healthy hogs exposed to the cultural disease remained well, and hogs that recovered from it, sickened and died when exposed to hog cholera.

Other investigators in the United States and Europe have confirmed these results, and it has been shown that the many different forms of bacteria found in the blood and tissues of most cholera hogs are not the specific cause of the disease. The different bacteria previously described may be considered secondary organisms of infection, and may influence the pathogenic changes occurring in the tissues of hogs affected with this disease.

Accessory Causes.

The wide prevalence of hog cholera can be accounted for by the lack of proper police control and the filthy, unhygienic conditions common in hog houses and yards. In neighborhoods where outbreaks occur, necessary precautions against the spread of the infection are not taken. Cattle, horses and wagons when driven through infected yards, may carry the disease to other farms. Pigeons, because of their habit of feeding in the yards, and dogs traveling about the neighborhood and feeding on the carcasses of dead hogs may distribute the infection. Hogs running at large may also carry the disease direct. Small streams polluted with the drainage from infected yards are common sources of disease. Large streams are less dangerous. The carcasses of dead hogs when allowed to decompose in the field, or when piled in ditches are centers of infection for the neighborhood. The buying of hogs in the stockyards, or buying and shipping them from an infected section for feeding purposes is at present a common method of spreading the disease.

Treatment.

Our experience with hog cholera has shown us that the most successful line of treatment consists of good care, a light diet, and the liberal use of disinfectants; that treatment should be used early in the outbreak and continued for several weeks; that the subacute form of the disease responds to this treatment; that it is of little use to attempt treatment in badly infected herds.

If the houses and yards are well arranged and can be cleaned and disinfected, it is not advisable to move the animals, but if

the quarters are old and more or less tumbled down, and the yards littered with corn cobs, manure piles, straw stacks, etc., it is advisable to provide better quarters. Such yards should be well drained. During the warm months of the year, plenty of range and protection from the sun and rain are necessary. A recently mowed meadow or a blue grass pasture, and a low shed open on all sides and amply large for the herd to lie under, give the animals a clean range and comfortable, cool quarters. Roomy, dry, well ventilated sleeping quarters and yards that have good surface drainage are best when the weather is cool and wet.

In most outbreaks it is advisable to separate the sick from the well hogs. Early in the outbreak and in the subacute form this is practical.

The economic importance of hog cholera from a very early period in its history has stimulated investigation work along the lines of preventive and curative treatment. In the latter part of the 90's the Bureau of Animal Industry, United States Department of Agriculture, carried on extensive field experiments with a serum prepared from cultures of *B. cholerae suis* and *B. suis septicus*. This was a failure so far as the control of the disease was concerned, but because it failed to protect exposed animals, those engaged in the work questioned the relation of the two organisms mentioned to the disease. This led to a line of investigation work that resulted in our present control methods and knowledge of the disease.

The credit of developing the first, and at present only successful hog cholera serum and method of vaccination, belongs to Drs. Dorset and Niles of the Bureau of Animal Industry. After several years of careful experimental work this serum was used in the field and its efficiency demonstrated. At a conference of state and federal officers, held at Ames, Iowa, June, 1908, the methods of serum production were demonstrated and its use as a preventive and curative agent were discussed. This resulted in a number of experiment stations and state officials taking up the work of serum production on a small scale, and in several states special appropriations for the work have been made.

The Serum Simultaneous Method and Treatment of Sick Herds with Serum.

Hogs that are able to be treated with serum, or vaccinated by the serum-simultaneous method should be dieted and given clean quarters with plenty of straw bedding, for at least 12 hours before they are handled. The skin over the region where the serum and blood are injected should be cleaned with a disinfectant. A two per cent. water solution of a good grade of tar disinfectant may be used, and the part scrubbed with the solution, so as to clean it as thoroughly as possible. The above precautions against the entrance of filth and germs through the opening in the skin made by the needle are necessary. Unless properly observed, septic infection or blood poisoning and fibrous formations occur.

The serum is usually injected into the muscles of the inside of the thigh. A glass barreled 20 c. c. hypodermic syringe with a short slip on needle is to be preferred for injecting the serum. In vaccinating hogs two syringes, one for the serum and one for the virulent blood are necessary. Usually a 6 c. c. glass barreled hypodermic syringe is used for the virulent blood, and the injection made beneath the skin of the opposite thigh into which the serum is injected. The hog is exposed to the disease by this method and at the same time given a protective dose of serum. This should be practiced in the absence of exposure to the disease from the yards or surroundings.

In recently infected herds the body temperatures of the hogs should be taken in order to separate the healthy from the diseased animals. This should be done in order to determine the quantity of serum necessary. Depending on the weight and extent of exposure, infected animals should receive from one-half to twice the dose usually given the healthy hogs.

More than 1300 hogs have been vaccinated, and about 4,000 treated in different sections of the state. The loss following vaccination has been about one and one-half per cent. This loss was due largely to blood poisoning resulting from the filth getting into the tissues at the point of injection. Among the treated hogs the loss was about 22 per cent. Many of the herds treated were badly infected and poorly cared for. It is impractical to attempt treatment under such conditions, and it is a waste of serum that might be used to a good advantage in an exposed or recently infected herd. The quantity of serum used under such conditions represented a large portion of that produced by the Department.

The total amount of serum produced was sufficient to vaccinate 12,000 hogs if 20 c. c. are taken as the average vaccination dose.

To secure funds for the work, the Department charges one and one-half cents per c. c. for the serum and one cent. c. c. for the virulent blood. This is a part of the cost of production and distribution. The average vaccination dose is 20 c. c. of serum and 2 c. c. of virulent blood, making the average cost of vaccinating young hogs about 32 cents.

In ordering serum the owner must state the condition, number and weight of the animals in the herd. Serum will not be furnished for the treatment of badly infected herds. For the present and until the method is better understood by farmers and stockmen, serum will not be sent direct to them. So far as possible, a field man from the Department will visit and treat or vaccinate the herd. Serum may be secured through the local veterinarian and administered by him without extra charge to the owner.

It may be stated in conclusion that the control of hog cholera has been made possible through the use of the serum-simultaneous method of vaccination. The Department of Agriculture and the State Experiment Stations are working to cheapen the cost of vaccination of hogs to the farmer. Bulletins have been written for the purpose of informing stockmen regarding the nature and methods controlling the disease. The final solution of the problem of control rests with the farmer.

(Adjournment.)

Third Annual Meeting

—of the—

INDIANA CATTLE FEEDERS' ASSOCIATION

—held in the—

Agricultural Building, Purdue University, Lafayette, Ind.,

Friday, November 19, 1909.

Program

MORNING SESSION

- 9:30 a. m. Inspection of Animal Husbandry Exhibit.
- 10:00 a. m. Meeting called to order..President C. W. Brackney
 WelcomePresident Stone
 Address, Beef Cattle..Prof. C. F. Curtiss, Ames, Ia.
 Demonstration in Judging Fat Steers.....
Prof. J. H. Skinner

Noon

AFTERNOON SESSION

- 1:30 p. m. Experimental Work at Purdue.....W. A. Cochel
 The Outlook for 1910, J. T. Alexander, Chicago, Ill.
 Election of Officers
 Visit Experimental Feed Lots
 Valuation of Cattle

Meeting called at 10 o'clock by President C. W. Brackney in
 Agricultural Building.

The first address given by Prof. C. F. Curtiss, Ames, Iowa.

BEEF CATTLE.

Prof. C. F. Curtiss, Ames, Iowa.

Mr. President,—Gentlemen: I have no particular message to bring to you today. I came over here to pay my respects to you people for the good work you are doing and get in touch with you and get a little of the inspiration that comes from an organization like this and the kind of work that is being done here. I have met a good many cattle feeders but I believe that I have never seen such a large number of feeders interested as you are in this important work and I want to congratulate you on being such a good looking body of men. I have always known cattle feeders were intelligent but you are good looking too.

The subject of cattle feeding is one of vital importance to the agriculture not only of Indiana but to the entire Middle West. There are a great many new problems presenting themselves as we develop the high priced land of this region. I have been astonished to know the extent to which cattle feeding has gone out of a good many regions of this country that were formerly famous for cattle feeding. I was particularly struck a few years ago in going over the region in Illinois made famous by Gillette, to find that there are scarcely any cattle left in that country now. The cattle raising business has almost entirely disappeared and to a large extent the cattle feeding business has gone out. The prevailing high prices for corn make it a great temptation for men to take their corn to the nearest market and take the immediate high returns that come from marketing their products in this way.

Some years ago, in attending a livestock convention in Illinois, I made the statement that the time had come that it was a losing business to keep a cow for the purpose of raising a calf to be developed into a beef steer. That statement sounded like heresy at that time to a good many of those men but I believe it is uniformly conceded today. That is one of the first conditions that we meet that tend to retard the cattle feeding business. When cattle could no longer be bred the feeder had to look elsewhere. Naturally the range was the source of supply but we are told that the range is rapidly passing, in fact, in many regions has already passed and the supply from there is diminishing; consequently there has been with a decreased supply, a higher price of feeders and that, coupled with the higher price of feed stuffs and the higher price of labor and all products have made it

rather discouraging during recent years to feed cattle; so much so that there has been a very strong tendency not only in this region but in the entire middle west to take the immediate cash returns that come in marketing high priced grains. But this process of working the soil for what we can get out of it from year to year without looking to the future productive capacity for that land is unsatisfactory to the prudent landholder. We know that eventually that is a losing business, though it may give the highest immediate returns. If the agriculture of this region is to be maintained there must be some means devised by which a large per cent. of the feed raised on the farms will be consumed on the farm. The thing that has made this country prosperous is that policy of converting the feed stuffs into finished products and shipping those products to the markets in the form which will command the highest return. It has been for many years the policy of the German political economists to import raw material and to export the finished product. The advantage comes from two sources; in the first place they conserve their natural resources and in the second place they put a premium on the skill and intelligence of their people. No movement of recent years has been fraught with greater significance than this movement for the conservation of our natural resources, and no part of our natural resources are of so much importance to all the people as the fertility of the soil. A few years ago in riding through central Illinois with the late L. H. Kerrick, that great feeder and a great man in every sense of the word, he related a little experience that occurred on his farm that I thought was of striking importance and significance. He told me that he had rented that year 80 acres of his land to a tenant living on an adjoining farm. The terms were these:—he was to have half of the corn crop delivered and the price to be fixed at the prevailing market price at any time the tenant saw fit to designate. This piece of land had been used as a pasture and feeding ground for about fifteen years and at the close of the season the tenant delivered to Mr. Kerrick 40 bushels of corn as his share of the rent, when corn was worth 40 cents a bushel. Some of the neighbors said to this tenant farmer,—are you not paying pretty high rate for that piece of land? He said, yes, I believe I have paid a high rate. I delivered 40 bushels of corn worth 40 cents a bushel, but I have been doing some figuring and I find that I could better pay \$16 for Mr. Kerrick's land than have the other land that I am farming for nothing. That is only a fair illustration of what we find all over this country in almost every community. This land was, when Mr.

Kerrick took it, a worn out farm. It had been built up and the fertility and productiveness of that land restored by feeding cattle, and by keeping the land in grass a large part of the time. It is rather a sad comment, and a reflection upon American agriculture that beginning with the eastern shores and going westward as the tide of civilization has moved west, the American farmer has left practically all the land he has occupied poorer and less productive than when he took it. That is, we have left the soil worn out until the value has depreciated, until we have reached this central west where we have yet comparatively virgin soil conditions. It is a question as to whether the people who are occupying these lands today are going to leave them in a worn out condition in the way the lands further east have been left. I know there are those who contend that soil can be maintained in its fullest productive capacity without feeding animals. It is claimed that by a system of fertilization and rotation and good cultivation it is not necessary to keep live stock in order to maintain fertility of the soil. Now whether that be true or not, and there is a difference of opinion on that point, we know that there is no region on the face of the globe of any considerable area that has ever succeeded in maintaining a perfectly profitable system of agriculture without due attention to the growing of livestock on the farm. While it may or may not be possible to maintain the productive capacity of our land without cattle feeding, I seriously question whether it will be done. And I believe that the region that has the most productive soil will be that region which gives due attention to the importance of raising livestock and of feeding and finishing animals on the farm and marketing them rather than in selling grain in the raw state. The old Scotch maxim was market the products on foot rather than in the bag.

There are a great many questions that you have been studying and that you are here to study in regard to the problem of feeding cattle and other livestock. We have had a great corn revival in this state and in our state and all these other states through the Mississippi valley and it has been a splendid thing. It has had a far reaching result. It has been productive of better methods of farming. It is a great thing to get people aroused and interested in problems of such vital importance. It has given the corn lands of the Mississippi valley an added value. The corn campaign, while it has had a marked benefit and splendid result, is going to be very largely lost in its full significance if we do not study the uses of the corn crops which we raise. We will fail to derive the full benefit of such a movement if we only grow

more corn, but fail to find how best to utilize that product and keep our lands in condition so they will best produce corn. A yield of 75 or sometimes 100 bushels at 50 or 60 or 75 cents looks pretty good and it is good and the strong temptation is to take the money and raise more corn and plow up the pasture, convert the meadows into corn fields. But only this week I heard a gentleman say he had sold his corn during the past year, or a part of it, that he had disposed of it in that way at \$1.20 per bushel by feeding corn and alfalfa to hogs. It is possible to get more than 50 cents a bushel by feeding corn to animals of the right kind and by the right methods, and the returns are not only increased that way, the net returns from the farm will be increased and the corn yield will be greater year by year. There are a good many men that have lost money feeding cattle,—there is no question about that but there are a good many that have made money. The men that have lost money during recent years, I believe, are the men who have fed by the old methods, who have failed to take into account that conditions have radically changed. There was a time in our state, and doubtless in your state, when men made it a practice to raise cattle, grow them 4 or 5 years and put them in the feed lot and feed them 8 or ten months, on corn worth 15 or 20 cents a bushel. It was easy to make profit in feeding cattle when feeders paid but a moderate price and made big fat cattle that the market demanded.

When we marketed our first car load of experimental cattle at Iowa Station about 15 years ago we had cattle of different qualities and breeds and types and cattle under 1800 pounds sold at a sacrifice of from \$1 to \$1.50 per 100. The buyers at that time insisted on a prime steer weighing 1800 pounds or more. Today a prime steer that weighs that much is at a serious disadvantage. The demand for beef has changed. Our consumers insist upon a different steer, with smaller percentage of fat and less waste to the consumer; so today the steer that weighs 1200 to 1400 pounds, if it is of the right quality and finish, is large enough, and it may be even smaller than that if finished properly. This has proved an advantage to the producer because everything being equal the younger thicker set steer is the cheaper beef production. We can not afford to grow our cattle out to mature 4 or 5 years and then feed them all winter. The long feeding period with high priced feed stuffs is in the main a losing business unless we have young cattle that are growing at the same time they are fattening. Mr. Kerrick used to say he did not fatten cattle, he grew beef. There is a decided advantage to the producer in using thicker,

earlier maturing animals as has been demonstrated here and other places. The thicker steer at 12 to 18 to 20 months of age is a very much more economical feeder or beef producer than the steer two or three years of age or upwards. The kind of cattle to be fed is, of course, an important factor. The Scotch feeders used to have a saying like this: "Look well to the animal that you select or you will be putting good meat in a bad beast." By "good meat," they meant good feed stuff.

I remember in discussing feeding before an audience in Kansas and I was emphasizing the importance of well bred stock and a man wanted to know if it would not be possible to buy cheaper or inferior stock and handle them at a profit. My reply was that if he bought them cheap enough and sold them quick enough and high enough he would make money. Another man said that it had been his experience, and that the only men who had made money on inferior cattle recently shipped into his neighborhood were the men that bought them one day and sold them the next. You can put too much high priced feed in any steer under present conditions, and the poorer the steer necessarily the shorter the feeding period, and the smaller the amount of expense that you can afford to put into that steer unless you have bought him remarkably low; so low that somebody has lost money in producing him. I do not think, as a rule, that we can raise feeders in this locality, especially by the old methods. Certainly we cannot keep a cow the year around to raise beef calves. If we raise them we will have to adopt the policies they use in Scotland. They buy good heavy milking grade cows of fairly good quality and breed them to beef sires and when they drop the calves they put on another calf, then in about four months they wean the two calves and put on another. Thus each year every cow in the herd raises three calves. They feed well all the time. The cow is kept up in good flesh and good condition so she can be turned off if they wish to dispose of her at the end of her milking period. Sometimes they were bred and used for another season but seldom more than two seasons. By this process they were making one cow raise three calves in a season and making it pay. If we are to raise feeders they must be raised by some such method as this.

I know a good many of the feeders in our section think it is more difficult to find feeders of high quality than it was 25 years ago. That may be true where dairy blood had been used. It is true the best cattle cannot always be bought. The men who are raising them are wanting them to feed out. Open range is going to be discontinued. The settler has been going in and settling

the land. He puts the land under the plow and sells the products of the field in the form of grain and hay but he does not take to livestock, so there is undoubtedly going to be a decrease in the supply from that source. Everything points to higher prices for beef. All the products used in manufacturing of beef will continue to be high. When we began our experiments at Ames gluten feed was bought at \$14 a ton, we could buy oil meal for \$18 to \$20 a ton and corn for 15 cents a bushel. Today we pay double and even more than double for all these. That is one reason why the shorter feeding period must necessarily come about and that can only come about by well bred stock that has been bred for early maturity and bred for beef production. In that connection, I do not believe there is a very great difference in the amount of return from a bushel of corn that animals of improved and unimproved types will give. That has been demonstrated by a number of feeding experiments. That sounds like heresy to many of you, but after all, the digestive capacity of the animals of different type does not materially vary. Take two steers of opposite types, put them in the feed lot under the same conditions and there will not be much advantage in favor of the improved type in the amount of immediate returns. But there will be a difference in the kind of product they make and there is where we look to returns from improved livestock. You will find in putting two steers side by side, keeping account, one improved, one inferior, that while the improved steer will consume more feed and give greater returns, the amount returned from a bushel of corn will be practically the same; but we have found one animal will be making a product that will sell at \$2 a 100 lbs. more than the other or about 40 per cent greater value of product. This value applies to not only what is put on in the feed lot, but it applies to the entire animal as well. So there is a vast difference there. It is not so much a question of bulk and aggregate weight as it is of quality. There is no market in the world that discriminates as strongly in favor of good meat products and good meat producing animals as the American market. There is a higher premium paid for superior products than in any other market in the world. They never have any difficulty in disposing of prime cuts but the difficulty is in disposing of cheaper parts of the carcass. The prime cuts do not constitute a very large part of the weight of the animal. The rib and loin constitute the chief. They weigh about 27% of the total but sell at about two-thirds of the entire value. The price drops from 18 to 20 cents a pound for prime cuts to 5 or 6 cents a pound for the cuts immediately adjoining

them, and the improved animal has this advantage; it puts more of its feed in the cuts that sell for the highest value. It puts its increase in live weight on its back in the form of these prime cuts. We found that in feeding dairy and beef animals a very large difference in the percentage of internal tallow. More was made by the dairy than by the beef steer. The improved animal does not put so much of its feed into internal tallow but puts more into prime cuts. This will enable the animal to take on finish so much sooner and enable the feeder to dispose of it sooner at greater profit.

The old unimproved type required a longer time to mature. They had to reach maturity before we could begin to fatten them. The improved animal will take on the flesh while it is growing, so instead of feeding them until they are three or four years of age, they can be finished at two or under. It is only the improved animal that has been bred for beef production that has this capacity.

There is another essential factor that enters into the feeding problem as it appears today and that is that we must make beef not only from better bred and earlier maturing animals, but we must make it with less grain and other high priced feed. That will be done not only by using animals of the improved type and good breeding, but I believe we will have to resort to the use of more grass as a factor in beef making. A good many men think that our high priced land is too valuable to grow grass and we have seen a good many pastures converted into corn fields in recent years because of the common belief that the high priced land cannot be profitably kept in grass. I believe that there is no greater fallacy in American agriculture. I believe that there is not any land in these central western states that is too good to grow good grass or will give better returns than we can get from grass properly handled. The trouble is the pasture has always been the last place we have given any attention in the line of improvement. It has been the neglected part of the farm. There are a good many men who have not looked upon the pasture as a means of supplying feed to the extent that it should be. In Great Britain you will find twice as large a percentage of the tillable area in grass as you will find in the Mississippi Valley. Their lands are much higher in value than ours and yet they have found it profitable, under their conditions of high priced feed and intensive farming to maintain two-thirds more in grass than we have in America. McCombie, the great cattle feeder and cattle breeder who made the Aberdeen Angus cattle famous for their

products was known throughout Scotland as "the grazier king." He was not only a great beef producer but he made it on grass because he found it more economical, more practical and more profitable to produce beef on grass than on grain to such a large extent. Some of the most successful cattle feeders very rarely do any cattle feeding in winter. They claim they cannot afford to. Now you have a more favorable climate here and it may not be a matter of as much importance as it is with us, but I think it is a factor of a great deal of importance. It costs a good deal of money to maintain animal heat or body temperature and during the winter months you are using necessarily high priced products. You are using grain products and roughage to a large extent that are high priced. The labor item introduced into your feeding operations is large. One way to reduce that is by resorting to grazing and to summer feeding, and the grass feeding has some other advantages besides economy. In the first place, labor is reduced to a minimum. Then aside from that the staple product being corn, and corn not a balanced ration, you need other products to supply the deficiencies. There is no way by which you can produce those products or obtain them on the farm in as economical a form as by means of the pasture. Then again a large part of the gain can be made on grass before the fattening period begins and the feeding period can be reduced to a minimum. That has been very practically demonstrated and with splendid results by your Experiment Station here. I do not think any more useful or valuable work has been done for the cattle feeders of this country than the experiments that have been conducted by this station showing the results from short feeding.

When you adopt the policy of short feeding you must have the right kind of animals to begin with and must have an animal in pretty good flesh. You cannot take an inferior animal or a well bred animal that is thin and follow the short feeding plan and get results. But if you have an animal well bred and well pastured you can reduce the feeding period one-half. Gains made on good pasture are invariably the cheapest made in the fattening period. If we were to put a large percentage of our farms into pasture and give the same attention to improving pasture lands that we have given to corn and grain lands I believe the returns would be as good as from any part of the farm. I believe grass will enable us to shorten the grain feeding period and to make beef at a great deal less outlay.

The British feeder says if he can buy our cotton seed meal and oil meal in the feeding operation and break even, he is the

gainer for the added fertility which it brings to the farm, but most of us want some returns as well as in the added value which it brings to the fertility of the farm.

We are also using a great deal of this alfalfa feed. The farmers of Nebraska are growing a great deal of this alfalfa and grinding it and shipping over here and selling it at \$20 to \$25 a ton. It is an excellent product and nearly everyone gets excellent results with it but that is an expensive nitrogenous product to buy when we can produce it on the farm either in the form of alfalfa or blue grass. And I believe that instead of buying so much of the nitrogenous high priced products we ought to give more attention to producing those products and cheapening the cost of producing beef.

Another most important matter is building up the fertility of our farms by means of nitrogenous crops and fertility that the legumes always bring to our land. Instead of endeavoring to produce more corn, part of the solution of the beef making problem is going to come in developing the grass lands and thereby reducing the amount of grain feeding that is necessary and at the same time introducing a better system of rotation in our crops that will build up a more successful and more profitable agriculture.

I want to commend the good work of this station in cattle feeding and this Cattle Feeders' Convention in studying the methods of raising cattle. It lies at the very foundation of permanent successful agriculture and I believe it means more for the agriculture of Indiana than you can estimate.

A SUMMARY OF FOUR YEARS' EXPERIMENTAL FEEDING AT PURDUE.

Prof. W. A. Cochel, State College, Penna.

The first work in feeding beef cattle at Purdue University Experiment Station was started during the fall of 1905, when three lots of cattle were fed:—one on ear corn and clover hay; one on ear corn, shredded stover and oat straw and a third on ear corn, linseed meal, shredded stover and oat straw. The cattle fed corn and clover, made an average daily gain of 2.08 pounds, while similar cattle, fed corn, shredded stover and oat straw, made average daily gain of 1.3 pounds or $\frac{3}{4}$ of a pound per day per steer in favor of clover as a roughage. In order to improve the ration of ear corn, shredded stover and straw, a similar lot, was fed linseed meal in addition, with the result that they made a daily gain of 1.78 pounds and returned a profit of \$4.11 as compared with \$8.62 in the clover fed lot. When there is a failure of the clover crop and the feeder must depend on other more available roughage, the use of linseed meal will increase the rate of gain, finish of cattle and profits from feeding. The lesson, to be learned from this experiment, is that it pays to supplement farm grown feed with commercial concentrates when legumes are not available.

The next year a different line of work was started by feeding calves, yearlings and two-year-olds to determine the influence of age on fattening. Corn silage and cotton seed meal were also included in the experimental rations. The first year, one lot of calves, one of yearlings and one of two-year-olds were fed shelled corn, cottonseed meal, clover hay and corn silage, which has proven to be an excellent ration in all of our work. At the close of the experiments, the two-year-olds had made the most rapid gain followed by the yearlings; calves making less than either the yearlings or two-year-olds. All lots started in the same condition and were fed the same length of time. We found when the two-year-olds were marketed in the spring that it took three months longer to finish the calves. During this year one lot of cattle was fed on corn and clover, another on corn and timothy. The clover cattle consumed 19.15 pounds corn per head, 8.27 pounds of clover hay and made a gain of slightly above 2 pounds for six months feeding period with profit of \$6.19 per head. The timothy cattle consumed 16.5 pounds of corn, 6.86 pounds hay and made a daily gain of 1.56 pounds with a profit of \$1.67 per steer.

The first thing noticed in using feeds rich in protein is that it stimulates the appetite of cattle. It may be noted that there was not only an increase in the amount of corn but also in the amount of roughage consumed by the use of clover instead of timothy. Another factor noticed is that the timothy fed cattle, not only made a less rapid gain but at the close of the experiment, after six months feeding, were worth less than the clover fed steers, so that by substituting clover for timothy we were able to increase rate of gain, decrease the cost of gains, increase selling value of cattle and the net profit. There is further profit than this as the hogs following clover fed steers did better than those fed timothy. Better results were secured in every way by feeding clover. If the additional profit secured from feeding clover instead of timothy were distributed over the number of pounds of hay fed, it makes clover hay worth \$18 per ton as compared with timothy at \$12.00 which is the most striking result obtained during the winter of 1907-8.

In the same year, corn silage was fed for the first time. You will notice that in this lot, one-half of the clover hay was substituted with corn silage. Practically the same result was secured as where corn and clover were fed; in other words, where protein is taken out of the ration and succulence added the two seemed to balance each other. When cottonseed meal was added to the ration of corn, clover and silage, the best results were secured. Silage was found to be one of the best feeds for cattle, but some nitrogenous supplement should always be used in order to bring out its full value. In this experiment where cattle were fed shelled corn and clover hay, they made 1.9 pounds and with cottonseed meal added, 2.6 pounds daily per head. Feeding cottonseed meal does not reduce the cost of gains so much as it increases the selling value of cattle on the market. Total profit per steer fed on corn and clover was \$10.26 during the winter of 1907-08; on corn, cottonseed meal and clover \$16.77.

During the first 90 days, Lot I made an average daily gain of 2.8 pounds to the steer; when fed for 180 days, 2.66 pounds which shows that when fed the same ration throughout six months feeding period, the fatter cattle become, the slower and more expensive are the gains. During the past year, one lot of cattle was fed through a period of six months on corn, cottonseed meal and corn silage without hay. The profit per head, as you will notice, was \$21.51, which is the largest returned from any lot fed at the Station during the last three years. During this year similar results, as heretofore, were secured in the age experiment.

In summing up the three years' results from feeding calves, yearlings and two-year-olds, it has been found that two-year-old cattle made more rapid, more expensive gains and returned a better profit. The man who is feeding cattle for the money there is in it and not breeding cattle, who depend on somebody else to raise feeders, will find it more profitable to feed older cattle than to produce baby beef. On the other hand, the man who is finishing out the cattle he raises and is giving time and attention to breeding in order to get the quality and type essential for making yearling beef, will find it more profitable to finish his cattle than to keep them until two years old. We have on one side the producers and on the other side the finishers and for the producer the yearling is the thing; for the feeder, the aged steer.

The average weight of calves taken directly from their dams for the past three years has been 500 pounds at beginning of experiment; of yearlings, 820 pounds; of two-year-olds, 1033 pounds. The calves were valued at \$22.89 per head; yearlings \$34.68; two-year-olds \$44.00. It has taken 270 days to make calves prime; 200 for yearlings, and 180 days for the two-year-olds. Average gain per head per day on calves, 1.89 pounds, for 9 months; yearlings, 2.2 pounds for 7 months; two-year-olds, 2.5 pounds for 6 months. Total cost of feeds for finishing calves, with corn at 50 cents per bushel, \$39.60; yearlings, \$40.43; two-year-olds, \$41.40. The average value of calves at the beginning of the experiments has been \$4.58 per hundred; yearlings, \$4.23; two-year-olds, \$4.26. The calves would have to be sold at the close of the feeding period at \$6.18 per hundred weight; yearlings, \$5.93; and two-year-olds \$4.26. The average value at time of marketing calves was \$67.01 per head; yearlings, \$81.50; two-year-olds, \$94.17. Average profit per head after allowing for cost of cattle and feeds, has been:—calves, \$5.18; yearlings, \$6.48; two-year-olds, \$8.77. No consideration is taken of the hogs and manure.

During the past two or three years, the Station has done experimental work on finishing yearlings in dry lot. At the close of the winter feeding experiments, there were 20 calves in each lot. They were divided into two groups of 10 each, one fed on pasture and the other in dry lot, both fed all the grain they would eat. An average of three years' work shows that calves fed in dry lot returned 67.2 cents for each bushel of corn they were fed, while those that were fed on pasture returned 65.2 cents. In other words, results of three years' work in feeding cattle in dry

lot vs. pasture show that where they have received full feed during winter it is advisable to continue feeding in dry lot.

Question: What do you allow for pasture?

Answer: 75 cents a month. And that just about pays for roughage consumed in dry lot.

When the steers are turned on grass, they shrink for the first ten days. It takes an additional ten days to regain the loss, so we really lose about three weeks' feeding. After they regain their original weight, they do just as well as those fed in dry lot. The average selling value of the dry lot steers was \$7.14 per hundred weight; of the pasture fed cattle \$6.97 per hundred weight.

Question: Do you ever try not feeding grain on grass?

Answer: No. Because we have not enough pasture to justify our doing so. When steers are fat enough to be sold as good butcher's steers, it is better to continue feeding grain ration in dry lot. If they are not to be sold until in the fall, there is no use feeding so heavily in winter.

During the past three years, the Station has issued one Circular No. 8, on "Purchasing Feeders," taking up sources of supply and general advantages and disadvantages of buying cattle on different markets; Circular No. 12, on "Methods of Beef Production" in the State, which is a summary of answers to over 2,000 inquiries sent out from the Station; and Circular No. 14, "Factors Influencing the Value and Cost of Feeders," dealing with age, type, condition, weight, breeding and quality. We have issued four bulletins on Steer Feeding giving results of experimental work which we have gone over here this morning: Bulletins 115, 129, 130, 136 and have two others in the course of preparations.

Question: Have you used any other supplemental feed like gluten meal?

Answer: No, we have not. We have used cottonseed meal for feeding with silage and feeding on grass because of the fact that we feel that silage has a laxative tendency, while cottonseed meal is constipating. For this reason these two feeds go well together. When feeding green feed of any kind, use cottonseed meal. When feeding corn fodder and oat straw, which are rather constipating, use linseed meal as it has a laxative effect. When feeding corn and corn silage, the use of gluten feed would not give quite so much variety to the rations, as it is also a corn product. It possibly has given you excellent results.

Question: Do you think it would be more profitable to add cottonseed meal to the corn and timothy ration?

Answer: If you must feed corn and timothy hay, possibly linseed meal would be the best supplement.

Question: How about half and half linseed and cottonseed meal?

Answer: Too much bother. Usually the feeder does not like to order two kinds where one will do. Practically same results would be secured by feeding half and half of each as either one by itself.

Question: Have you any data as to the value and profit gained in feeding of hogs from manure?

Answer: Yes. Especially with the two-year-old cattle, we have been able to get from 2 to $2\frac{1}{2}$ pounds of pork for every bushel of corn fed the steer.

Question: Did you ever try the use of corn, corn cob and all?

Answer: No, we have not as yet progressed that far. That brings up the question of use of shelled corn and why we use it. We have found that when we buy ear corn it is quite variable. We frequently get too much cob and for that reason we have felt it is better for us to use shelled corn in each lot so that we know exactly what we have fed rather than feeding something so variable as ear corn. I think you get equally as good or better results to feed ear corn. When cattle are started on feed they will consume the cob with some relish. After six weeks to two months of feeding, they leave the cobs, it is then better to use shelled corn. The same is true in regard to grinding corn. With hogs at present prices they will utilize profitably everything the steer wastes from with shelled or ear corn. If we grind it, the hog can not make best use of it and for that reason, we prefer to use shelled corn. If short of hogs, then of course the profitable thing to do is to grind corn for cattle.

Question: Have you any data as to decrease in gains on steers in six months, weighing monthly?

Answer: In one lot we found that steers gained 2.8 pounds per head daily for four months; 2.66 pounds for six months. In all the bulletins you will find information as to the rate of gain. I may say that unless we improve the palatability of the feeds very materially steers begin to decrease in gains when they begin to get thick fat; about the last month before market.

Question: How low have they dropped?

Answer: Dropped down to about $1\frac{1}{2}$ to $1\frac{3}{4}$ pounds daily.

Question: If you change his feed how would it be?

Answer: Cattle which have been getting corn and clover or corn and timothy, etc., will increase in the rate of gain when the

linseed or cottonseed meals are added. If you are feeding a poor ration and improve it, undoubtedly you would get a better gain and better finish. If you are feeding a good ration all through the feeding period and have no means of improving it, they will decrease in rate of gain towards the end of the feeding period. We have been feeding three pounds of cottonseed meal.

Question: I want to know if you had increased the proportion, what would have been the results?

Answer: You might increase until, feeding 5 or 6 pounds per day, and possibly secure more rapid gain but they would be more expensive. Three pounds is as much as you can afford to feed with feeds at prevailing values.

Question: Will the age and size of cattle have anything to do with that?

Answer: We have been feeding 2 to 2½ pounds to each thousand pounds live weight.

Question: Did you ever experience any bad results on hogs from the use of cotton seed meal?

Answer: No. We have fed cottonseed meal in five lots for last three years and with one exception no bad results have been secured. We had one hog, winter before last, that persisted in jumping up and eating cottonseed meal from the steer trough which resulted fatally.

Question: Do you notice any difference when you add cottonseed meal to the ration in the production of pork?

Answer: We have secured a greater production of pork.

Question: Do you have any trouble in cattle becoming restless when grass season begins?

Answer: We have not because they have been almost surrounded by dry lots and could not get a good smell of grass. I think that would be more evident if feeding ration of corn and timothy or corn and corn stover than where they are getting everything they need.

Question: Did you make any estimates in regard to richness of silage?

Answer: Yes. We have done that in placing the price of silage. We have taken the estimated value of the corn and value of silage accordingly. Last year, our silage was very poor and you will find that stated in the bulletin but the year before it was quite rich in corn.

Question: If it is very rich, can you leave off some corn?

Answer: Well, we feed according to appetite, just what

the steers will clean up readily twice a day. If they are getting more corn in the silage, they will not eat quite as much dry corn.

Question: Have you ever made test of feeding grain once and twice daily?

Answer: Not in an experimental way, but in farm practice when cattle are on grass we feed only once a day but in winter feed twice a day.

Question: What is your experience in feeding cottonseed meal on grass with corn?

Answer: Like it better than any other feed ever fed.

Question: Which is better,—to have corn before the cattle all the time or feed twice a day and let them clean it up?

Answer: We have had better results when it is cleaned up, though that will depend largely on the feeder himself. If you have a careful feeder who will watch the cattle or are feeding them yourself, it is better to feed them regularly and see that they clean up their grain, but on the other hand, if you have to depend on most anyone to feed, better results may be secured by keeping grain in troughs at all times.

Question: Do you keep your cattle in stall all the time?

Answer: Each lot of cattle is given an open shed which we try to keep dry and bedded. Careful experimental work has shown where cattle are getting full feed of grain that they will do better in open shed than in closed barns. Of course, our conditions here are not ideal. I would very much rather have the cattle yards paved and would prefer to feed the roughage indoors but feed grain outside.

Question: Do you feed your cattle outside in bad and rainy weather.

Answer: All weather.

Question: Are you troubled with sore feet in your cattle?

Answer: Have had very little difficulty. Occasionally have one that gets sore between his toes just the same as in all feed lots. The treatment we have been giving, saturate the space between the toes with crude coal tar dips. This will usually result in a cure.

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